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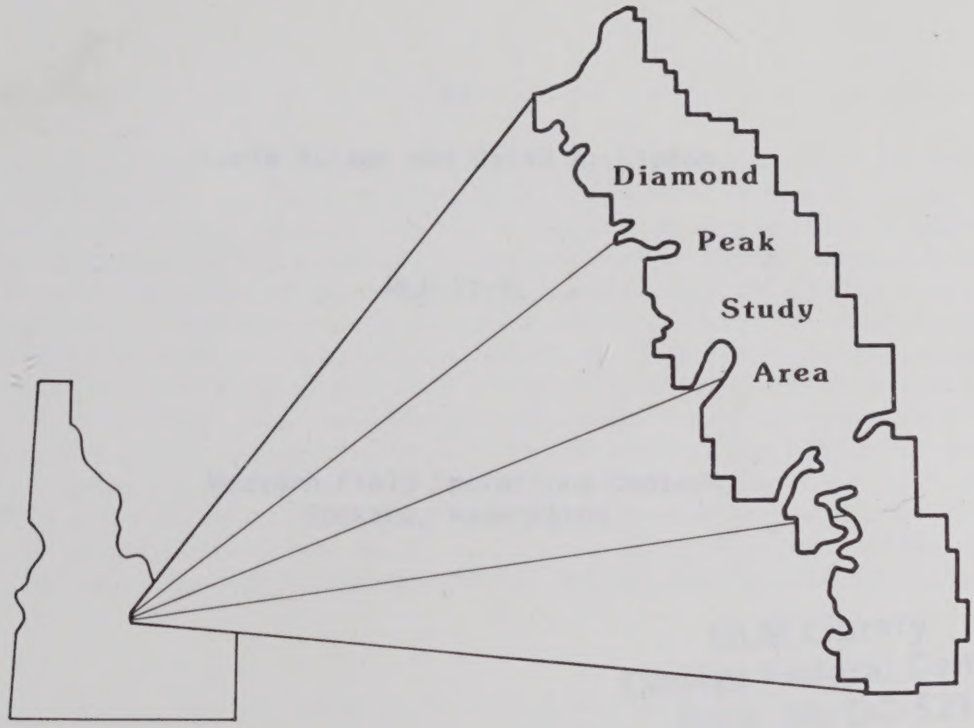

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MINERAL RESOURCE APPRAISAL OF THE DIAMOND PEAK STUDY AREA, BUTTE, CLARK, AND LEMHI COUNTIES, IDAHO

by

Lucia Kuizon and David A. Lipton

MLA-11-91

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In 1986 and 1987, at the request of the U.S. Forest Service, the U.S. Bureau of Mines studied the Diamond Peak area comprising 183,000 acres in the Challis and Targhee National Forests in order to evaluate its identified mineral resources. More than 3,000 mining claims were located in three mining districts between the years 1882 and 1986. Approximately 230 mining claims in and the 150 claims adjacent to the study area were current in 1986, when Bureau of Land Management mining records were researched for this study. A total of 1,270 samples were collected from these sites (30 were for alluvial placer). Results of the investigation help determine the suitability of the study area for inclusion into the National Wilderness Preservation System. Lead-, silver-, zinc-, copper-, and gold-bearing minerals occur as veins and replacement bodies in shear and fault zones in Precambrian and Paleozoic calcareous sedimentary rocks that have been complexly folded and faulted. Total production from the three mining districts in the study area was more than 150,000 tons of ore between 1901 and 1982. Approximately 11,600 tons of subeconomic resources consisting of lead, silver, zinc and copper were identified within the area. Over 37,500 tons of lead and zinc subeconomic resources were identified just outside the area. In addition, lead-, silver-, and zinc-mineral resources were identified at 4 mines within 2 miles of the study area. Iron mineral resources were also identified just outside the area.

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PREFACE

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and U.S. Bureau of Mines to conduct surveys on Federal lands ". . . to determine the mineral values, if any, that may be present . . . ." Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a Bureau of Mines mineral survey of part of the Diamond Peak roadless area (formerly 4-601), Butte, Lemhi and Clark Counties, ID, which was classified as Non-Wilderness Recommended during the Second Roadless Area Review and Evaluation (RARE II) by the Forest Service, (January 1979).

The data in this open-file report were gathered and interpreted by Bureau of Mines personnel from Western Field Operations Center, East 360 Third Avenue, Spokane, WA 99202. The report has been edited by members of the Branch of Resource Evaluation at the field center and reviewed at the Branch of Mineral Land Assessment, Washington, DC.

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

cu ft	cubic feet
ft	foot
in.	inch
mi	mile
ppb	parts per billion
ppm	parts per million
lb	pound
ton(s)	short tons
tons/day	short tons per day
oz	troy ounce
oz/ton	troy ounce per short tons

SUMMARY

In 1986 and 1987, at the request of the U.S. Forest Service, the U.S. Bureau of Mines studied the Diamond Peak area comprising 183,000 acres in the Challis and Targhee National Forests in order to evaluate its identified mineral resources. The study area is located in Butte, Lemhi, and Clark Counties, Idaho, about 65 mi northwest of Idaho Falls.

Lead-, silver-, zinc-, copper-, and gold-bearing minerals occur as veins and replacement bodies in shear and fault zones in Precambrian and Paleozoic calcareous sedimentary rocks that have been complexly folded and faulted.

Total production from the three mining districts in the study area was more than 150,000 tons of ore between 1901 and 1982. In 1986, there were 230 mining claims in and 150 claims adjacent to the study area, including two patented claims. The Great Western and Excelsior mines were the major producers of lead and silver in the study area. Except for the Great Western and Wilbert, other mines have not produced since about 1950. At the Great Western mine, small-scale mining for silver took place in 1986 and 1987; it was inactive in 1988. Several mining companies have conducted exploration for zinc and gold in the North Creek area near the Sentinel mine and Johnson prospect, and in the Camp Creek area.

Major mines and prospects were excluded by the U.S. Forest Service from the study area, except for the Great Western and Excelsior mines. The purpose of this study was to determine if mineral resources exist within, and known mineral occurrences extend into the study area. An estimated 6,700 tons of lead-silver-zinc subeconomic indicated and inferred resources were identified at the Excelsior mine. Approximately 4,900 tons of lead-silver-zinc subeconomic indicated resources were identified at the Great Western mine. Approximately 37,500 tons of subeconomic indicated and inferred resources are identified at the Sentinel mine, just outside the study area. At the Bell View mine, just outside the study area, the USBM. estimated 6,000 tons of subeconomic indicated iron resources are in place and 3,500 tons of iron are on the dump. These resources are subeconomic (at 1988 metal prices) because of insufficient tonnage and/or grade at these properties. Other mines and prospects in the study area showed anomalous metal concentrations. In addition, the U.S. Geological Survey identified areas with high to moderate resource potential for polymetallic vein, replacement, and skarn type deposits near the Wilbert, Badger, and Excelsior mines. Previous studies identified about 2,000 tons of inferred resources containing lead- and silver-bearing minerals at the Bighorn mine and about 1,500 tons of indicated and inferred resources containing lead-, zinc-, and silver-bearing minerals at the Whitebird mine. Both mines are just outside the study area. Further detailed exploration would be necessary to evaluate additional identified resources, and to determine whether other resources extend into the study area.

INTRODUCTION

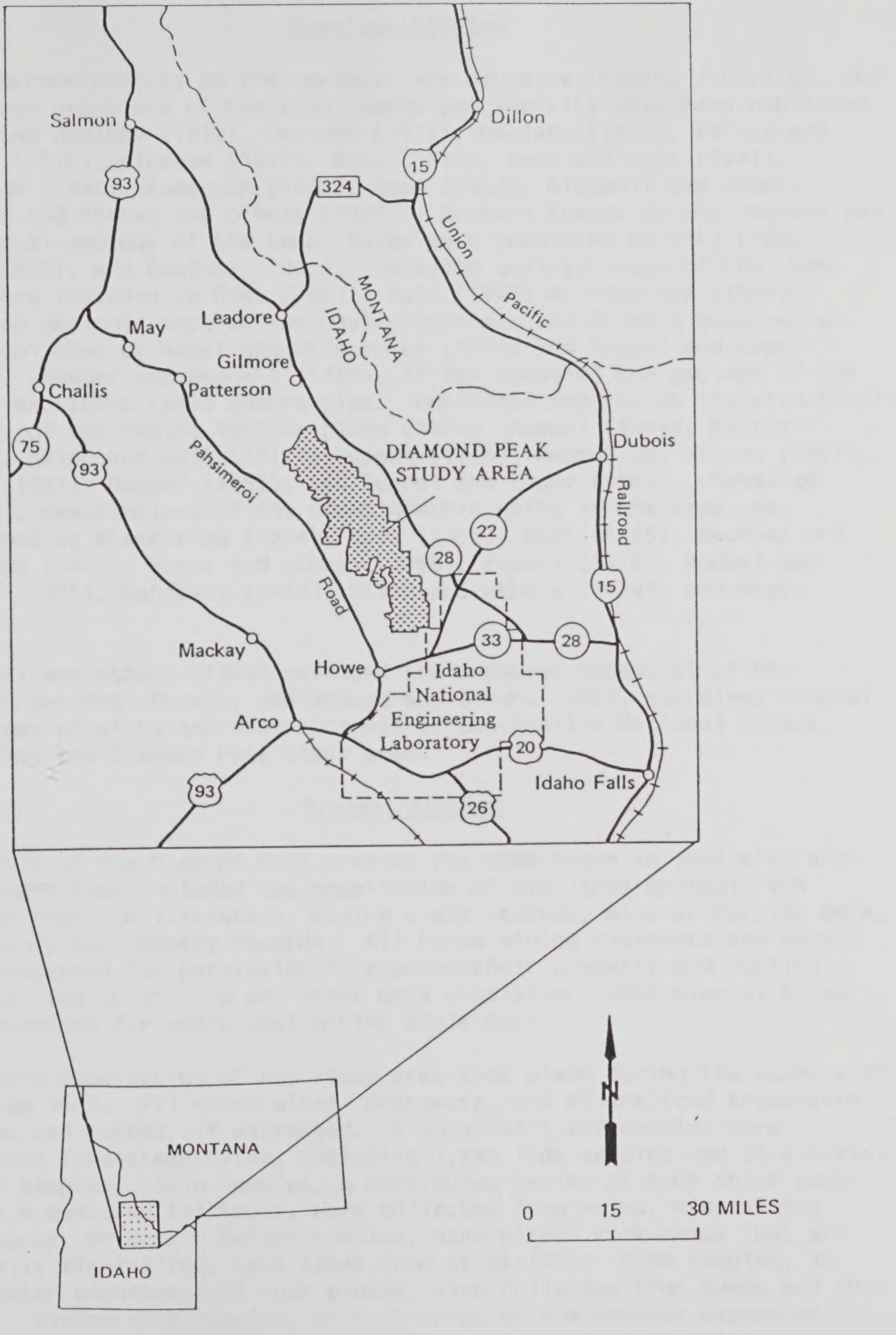
This report describes the USBM (U.S. Bureau of Mines) study to evaluate identified mineral resources of the Diamond Peak study area (formerly 4-601, now 6-601 and 15-601) at the request of the USFS (U.S. Forest Service). The USBM examined individual mines, prospects, claims, and known mineralized zones to evaluate identified mineral resources. Results of the investigation help determine the suitability of the study area for inclusion into the National Wilderness Preservation System. Although the immediate goal of this and other USBM mineral surveys is to provide data for the President, Congress, government agencies, and the public for land-use decisions, the long-term objective is to ensure that the nation has an adequate and dependable supply of minerals at a reasonable cost.

Setting

The Diamond Peak study area includes 183,000 acres in the southern Lemhi Mountain Range within the Challis and Targhee National Forests. The study area extends approximately 35 mi from Trail Peak on the north side to the mouth of Black Canyon in the south, and is within Butte, Lemhi, and Clark Counties, Idaho (pl. 1). The summit of the Lemhi Range is the boundary between the Challis portion (west side) of the study area, and the Targhee portion (east side). The study area is about 65 mi from Idaho Falls, Idaho, and can be reached by U.S. Interstate 15 and Idaho State Highways 20, 28, and 33 (fig. 1). Heavily mined areas along major drainages are excluded from the study area.

Local access into the study area is by jeep trails from the Pahsimeroi road in Little Lost River valley on the west side, and from State Highway 28 in Birch Creek valley on the east. The Mackay branch of the Union Pacific Railroad is located about 30 mi southwest in Arco, Idaho. The study area is just north and west of the Idaho National Engineering Laboratory test site.

The southern Lemhi Mountains are part of the northern extension of the Basin and Range physiographic province, and are within the Idaho-Wyoming Thrust Belt, which is in the Overthrust Belt of the North American Cordillera (Maley, 1987, p. 96, 108). Diamond Peak, at elevation 12,197 ft, is the highest point within the study area; the lowest point is a creek at the southwest corner at about 5340 ft. Mountains have been shaped by Quaternary glaciers, and are extremely steep and jagged. Valleys are narrow with little or no floodplain. Average annual precipitation in the Lemhi Range is 20 to 30 in. In the Little Lost River and Birch Creek valleys, precipitation is about 10 to 20 in. per year. Vegetation, particularly timber, is sparse. Sagebrush and grasses grow in the valleys and on alluvial fans. Spruce, fir, and a variety of brush and grasses grow at higher elevations. Alpine meadows may be found at the crest of Lemhi Range (University of Idaho, 1983).


Salmon
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Union
Pacific
MONTANA
IDAHO
Leadore
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Challis
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Road
DIAMOND PEAK
STUDY AREA
Dubois
Railroad
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Mackay
Howe
Idaho
National
Engineering
Laboratory
Arco
20
Idaho Falls
93
26
N
MONTANA
IDAHO
0
15
30 MILES

FIGURE 1.– Location map of the Diamond Peak study area, Butte, Clark, and Lemhi Counties, ID

Previous Studies

Numerous reports on the geology, ore deposits, mining districts, and mines and prospects of the Lemhi Range and vicinity have been published, including Umpleby (1913), Umpleby (1914), Umpleby (1917), Varley and others (1919), Kirkham (1927), Ross (1933), Ross and Carr (1941), Anderson (1947), Anderson (1948), Ross (1961), Mitchell and others (1981), and Strowd and others (1981). Masters theses on the geology and structural geology of the Lemhi Range were completed by King (1960), Hait (1965), and Beutner (1968). Detailed geologic maps of the Lemhi Range are included in Ross (1961), Hait (1965) and Beutner (1968). Detailed geologic maps of the Hawley Mountain and Gilmore quadrangles were published by Mapel and Shropshire (1973) and Ruppel and Lopez (1981). Rember and Bennett (1979a, 1979b) compiled the geology of the Dubois and Idaho Falls quadrangles. Published reports on the structural geology of the region include Sloss (1954), Ruppel (1964), Beutner (1972), Skipp and Hait (1977), Ruppel (1978), Ruppel and others (1981), Skipp (1981), Ruppel (1982), and Ruppel and Lopez (1984). Detailed geologic descriptions of the stratigraphic units in the area are described by Blackstone (1954), Ross (1962), Hait (1965), Beutner and Scholten (1967), Hobbs and others (1968), Ruppel (1975), Ruppel and others (1975), Sandberg (1975), Skipp and others (1979), and Hogan (1981).

Worl and others (1989) assessed the resource potential of the Challis National Forest, and McHugh and others (1991) appraised mineral resources of mines and prospects within the Challis National Forest, including the Diamond Peak study area.

Present Studies

Study of the Diamond Peak area by the USBM began in 1986 with pre-field work that included the compilation of available geologic and mineral resource literature, mining claim records, mine production data, and agency and company records. All known mining claimants and owners were contacted for permission to examine their property and publish results, and to acquire any other data available. USFS mineral files were examined for additional mining claim data.

Field examination of the study area took place during the summers of 1986 and 1987. All known mines, prospects, and mineralized areas were sampled and mapped, if warranted. A total of 1,270 samples were collected from these sites, including 1,240 lode samples and 30 alluvial placer samples. Chip samples, a continuous series of rock chips taken across a measured thickness, were collected from veins, mineralized structures, or beds. Select samples, hand-picked rock chips that are generally mineralized, were taken from stockpiles. Grab samples, an unselected assortment of rock pieces, were collected from dumps and rock piles. Random chip samples, or rock chips of homogeneous exposures collected at random intervals, were taken where mineralization was suspected, but not observed. Alluvial placer samples of sand and gravel believed to contain concentrations of heavy minerals, such as gold, garnet, and monazite, were collected from stream drainages.

Lode samples were crushed and otherwise prepared at the USBM, WFOC (Western Field Operations Center), and sent to Chemex Labs, Ltd. in Sparks, NV, for analysis. Samples were analyzed by ICP-AES (Inductive Coupled Plasma plus Atomic Emission Spectroscopy) in which a sample is placed in an electrically generated, high-temperature argon plasma that causes various elements within the sample to emit a characteristic wavelength. Samples containing elements greater than the upper detection limits of ICP-AES were further analyzed using traditional fire-assay and atomic absorption methods. Table A-1 lists the methods and detection limits for selected elements analyzed by Chemex for the Diamond Peak study. All analyses are reported in parts per million (ppm) and parts per billion (ppb) unless otherwise noted.

For this report, the terminology of Levinson (1980) was used to describe analyses for mineral concentrations less than ore grade. "Trace," or "small amount" of metallic minerals, indicates that there is less than 1,000 ppm (0.1 percent) present; "minor amount" means there is greater than or equal to 1,000 ppm; and "anomalous" or "significant amount" indicates there is at least twice average crustal abundance present for that element.

Alluvial sample concentrates were sent to WFOC for processing and special placer analyses. Samples were checked for fluorescence and radioactivity, and then processed using a Wilfley table[1] to separate the heavy mineral fraction and gold. Gold was hand-picked and weighed; very fine gold was amalgamated, separated, and also weighed.

Resource quantities were determined as the product of the strike length, width, and estimated depth of the mineralized body. Average grades are based on sample data weighed by sample length. The USBM Cost Estimation System was used to estimate economic feasibility of certain properties. Resource classifications in this report are based on USBM and USGS (1980). Table A-2 summarizes the appropriate resource definitions.

ACKNOWLEDGEMENTS

The authors extend thanks to the following WFOC staff members for their capable field assistance and contributions to various property descriptions in this report: David A. Benjamin, David Brink, David Frank, Terry J. Close, Terry R. Neumann, Clayton M. Rumsey, Charles Sabine, Ernest T. Tuchek, and Spencee L. Willett. Special mention goes to Richard A. Winters for writing, drafting, and editing contributions; and to Thomas W. Camm and Scott A. Stebbins for assistance with economic evaluations.

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[1] Product names are used for descriptive purposes only and do not constitute a product endorsement by the U.S. Bureau of Mines.

The authors appreciate assistance from USFS staff, especially Bill N. Savage, Challis National Forest, and Keith Tweedie, Targhee National Forest. Several claim owners, including Don Owen, Bill Yearsley, Frank Byrd, Dick Nichols, and Wilma Davis, were particularly helpful during the course of this study.

GEOLOGIC SETTING

The southern Lemhi Range is part of the Medicine Lodge allochthonous (upper) thrust plate which is composed predominantly of Precambrian and Paleozoic sedimentary rocks that originated about 100 mi west of their current position (Ruppel and Lopez, 1984, p. 34). The fault trace of the Medicine Lodge thrust is located 25 mi east of the Lemhi Range in the Beaverhead Mountains. The Challis portion contains Precambrian quartzite, argillite, and phyllite; Paleozoic dolomite, quartzite, and limestone; and Quaternary fan and alluvial deposits. The Targhee portion of the study area contains Paleozoic limestone; Tertiary and Quaternary volcanic rocks; and Quaternary glacial, fan, landslide, and alluvial deposits. (Beutner, 1968, pl. 1, and Hait, 1965, pl. 1).

The structural geology of the southern Lemhi Range is extremely complex (fig. 2). Rocks above the Medicine Lodge thrust surface were intensely sheared and brecciated during the late Cretaceous and early Tertiary. Subsequently, in the early Tertiary to early Quaternary, the area was subjected to folding that overturned rock units, and faulting that included imbricate thrusting, high-angle normal faults, strike-slip faults, and basin and range block faults. (See Ruppel, 1982).

In the Lemhi Range, metallic mineral deposits in the Medicine Lodge upper thrust plate typically occur above the thrust surface in the Lemhi Group or Swauger Formation and younger rocks (Ruppel, 1978, p.8). Ore deposits are generally associated with granodiorite-quartz monzonite stocks and sheets intruded into the thrust plate during the Tertiary. Deep-seated magma used steep faults as conduits along uplifted blocks along the flanks of the central Lemhi Range. The magma spread laterally as sheets into imbricate thrusts faults and bedding planes along the base of the plate above the thrust surface. (See Ruppel and Lopez, 1984, p. 35-36).

In the Diamond Peak study area, metallic mineral deposits and occurrences in the Trail Peak area are associated with an exposed granitic stock or sheet. South of Trail Peak, deposits are related to mineralizing fluid leakage from a buried intrusive body, or deposition of secondary minerals above a primary sulfide zone (Ruppel, 1978, p. 19). Lead-, zinc-, silver-, and copper-bearing minerals occur in veins and as replacement bodies in shear zones in the zone of folding, shearing, and faulting in Precambrian and Paleozoic calcareous sedimentary strata above the Medicine Lodge thrust surface. Many of the veins are leached or oxidized, and contain predominantly secondary lead and zinc minerals and iron oxides. Metallic minerals also occur as veins and stringers in quartzite, or are disseminated in quartzite, phyllite, argillite, dolomite, and limestone that are intensely fractured and broken, sheared, or jointed.

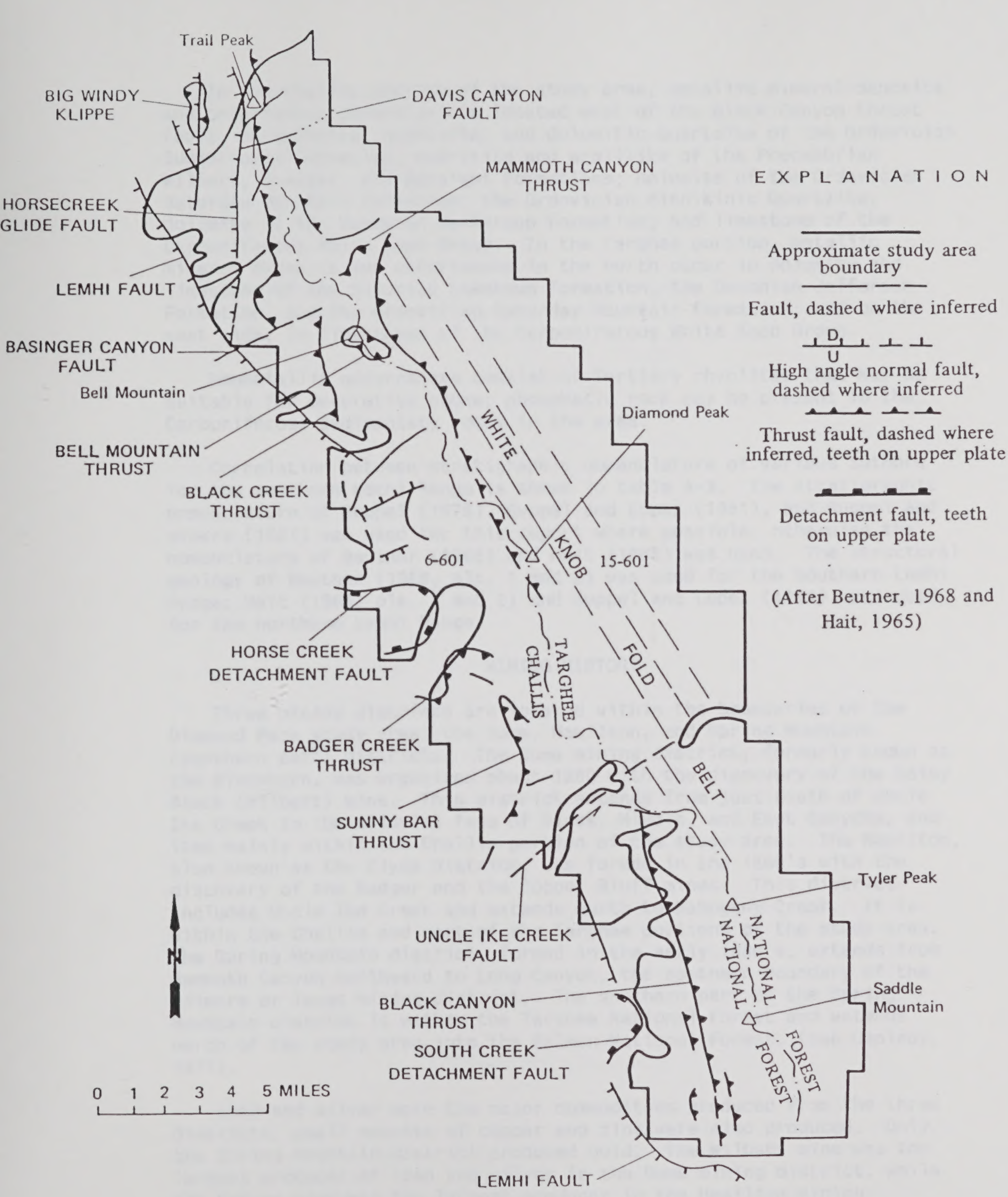
Trail Peak
BIG WINDY KLIPPE
DAVIS CANYON FAULT
MAMMOTH CANYON THRUST
HORSECREEK GLIDE FAULT
LEMHI FAULT
BASINGER CANYON FAULT
Bell Mountain
BELL MOUNTAIN THRUST
BLACK CREEK THRUST
Diamond Peak
WHITE KNOB FOLD BELT
6-601
15-601
HORSE CREEK DETACHMENT FAULT
TARGHEE
CHALLIS
BADGER CREEK THRUST
SUNNY BAR THRUST
Tyler Peak
UNCLE IKE CREEK FAULT
NATIONAL
NATIONAL
Saddle Mountain
BLACK CANYON THRUST
SOUTH CREEK DETACHMENT FAULT
FOREST
FOREST
N
0 1 2 3 4 5 MILES
LEMHI FAULT
EXPLANATION
Approximate study area boundary
Fault, dashed where inferred
D
U
High angle normal fault, dashed where inferred
Thrust fault, dashed where inferred, teeth on upper plate
Detachment fault, teeth on upper plate
(After Beutner, 1968 and Hait, 1965)

FIGURE 2.– Generalized tectonic map of the Diamond Peak study area

In the Challis portion of the study area, metallic mineral deposits and occurrences generally are located west of the Black Canyon thrust fault, in dolomite, quartzite, and dolomitic quartzite of the Ordovician Summerhouse Formation; quartzite and argillite of the Precambrian Wilbert, Swauger, and Gunsight Formations; dolomite of the Ordovician Saturday Mountain Formation; the Ordovician Kinnikinic Quartzite; dolomite of the Devonian Jefferson Formation; and limestone of the Carboniferous White Knob Group. In the Targhee portion, metallic mineral deposits and occurrences in the north occur in dolomite and limestone of the Silurian Laketown Formation, the Devonian Jefferson Formation, and the Ordovician Saturday Mountain Formation; and on the east side, in limestones of the Carboniferous White Knob Group.

Nonmetallic occurrences consist of Tertiary rhyolites that may be suitable for decorative stone; phosphatic rock may be present in the Carboniferous sedimentary rocks in the area.

Correlation between stratigraphic nomenclature of various authors for the southern Lemhi Range is shown in table A-3. The stratigraphic nomenclature of Ruppel (1978), Ruppel and Lopez (1981), and Ruppel and others (1981) was used for this report where possible; otherwise the nomenclature of Beutner (1968) and Hait (1965) was used. The structural geology of Beutner (1968, pls. 1 and 2) was used for the southern Lemhi Range; Hait (1965, pls. 1 and 2) and Ruppel and Lopez (1981) were used for the northern Lemhi Range.

MINING HISTORY

Three mining districts are located within the boundaries of the Diamond Peak study area: the Dome, Hamilton, and Spring Mountain (southern part) districts. The Dome mining district, formerly known as the Blackburn, was organized about 1880 with the discovery of the Daisy Black (Wilbert) mine. This district extends from just south of Uncle Ike Creek to the alluvial fans of Black, Middle, and East Canyons, and lies mainly within the Challis portion of the study area. The Hamilton, also known as the Clyde district, was formed in the 1880's with the discovery of the Badger and the Copper Bluff mines. This district includes Uncle Ike Creek and extends north to Mahogany Creek. It is within the Challis and part of the Targhee portions of the study area. The Spring Mountain district, formed in the early 1880's, extends from Mammoth Canyon northward to Long Canyon, the southern boundary of the Gilmore or Texas mining district. The southern part of the Spring Mountain district is within the Targhee National Forest and extends north of the study area into the Salmon National Forest. (See Umpleby, 1917).

Lead and silver were the major commodities produced from the three districts; small amounts of copper and zinc were also produced. Only the Spring Mountain district produced gold. The Wilbert mine was the largest producer of lead and silver in the Dome mining district, while the Badger mine was the largest producer in the Hamilton mining district. The Silver Consolidated Mining Company property on Spring Mountain, Lemhi-Union, and Excelsior mines were the largest producers in the Spring Mountain district. Ore from these districts was

concentrated in mills at the Wilbert and Iron Mask mines, and shipped to smelters in the Nicholia mining district, Idaho and in Utah. A small smelter was built in 1909 at Hahn, Idaho to service the Spring Mountain district (Ross and Carr, 1941; Umpleby, 1913).

Reported production from these three mining districts is summarized in table 1. Individual mine production is detailed in the property descriptions (appendices B and C).

TABLE 1.--Recorded mineral production in the Dome, Hamilton, and Spring Mountain mining districts (Ross, 1961; USBM production files)

Mining district (years)	Ore (tons)	Gold (oz)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Dome (1907-1982)	145,244	43	381,109	72,566	41,260,677	759,729
Hamilton (1901-1955)	2,126	59	11,825	38,852	599,339	
Spring Mountain (1901-1963)	5,269	258	49,079	44,285	2,317,300	26,015
Totals	152,639	360	442,013	155,703	44,177,316	785,744

More than 3,000 mining claims were located in the three mining districts between the years 1882 and 1986. Approximately 230 mining claims within and 150 claims adjacent to the study area were current in 1986, when BLM (Bureau of Land Management) mining records were researched for this study. The Wilbert patented property lies outside the study area, and the Excelsior patented property lies within the Targhee portion of the study area.

In 1986 and 1987, the Great Western mine was developed by small-scale underground hand-resuing mining methods; in 1988, the mine was inactive. Between 1985 and 1988, a few mining companies examined the area between North Creek and South Creek for gold and zinc occurrences. Annual assessment work was performed for most of the mining claims in the study area.

COMMODITY HIGHLIGHTS

Historically, lead- and silver-bearing minerals were the most important commodities in the Diamond Peak study area. To date, gold has been only a minor element associated with lead and silver deposits in the Spring Mountain mining district. Copper and zinc also occur in minor amounts with lead and silver minerals in the Diamond Peak study area and vicinity. Small iron replacement bodies occur in and adjacent to the study area, but there has been no production from them.

Quartzite occurs throughout the study area in the Ordovician Kinnikinic Quartzite, the Precambrian formations, and unnamed Carboniferous units. Limestone and dolomite also occur in the area within the Paleozoic and Precambrian formations. Approximately 95 percent of the 286 sq mi of study area contains quartzite, limestone, and dolomite within 17 stratigraphic units.

Tertiary rhyolites in or near the Targhee portion of the study area have tabular weathering properties that could make them suitable for use as decorative stone. Phosphatic rock, suitable for agricultural purposes, may occur in the Targhee portion.

Identified lead, zinc, and silver resources adjacent to the Diamond Peak study area are subeconomic at 1988 prices. The mining method recommended for the development of resources at the Sentinel mine is open-pit mining for this high-value, low tonnage deposit (Camm, 1988, written communication). In 1986 and 1987, underground hand-resuing methods were utilized for select mining at the Great Western mine, and are probably suitable for other small-scale operations in the area (Stebbins, 1989, personal communication). Additionally, underground mining methods would be required at most properties in the Trail Peak area. As elsewhere, production costs are influenced by deposit accessibility, deposit geometry and depth, rock characteristics, and amenability to metallurgical processing. Important considerations affecting resource values are market conditions and in some cases, import dependence.

The presence of quartzite, limestone, and dolomite is noted here for the purpose of completeness. These rock units were not considered identified resources because of their distance from a major market, such as Boise or Idaho Falls; their relative inaccessibility and location on the often steep slopes of the Lemhi Range; and their widespread occurrence in Idaho and Montana. Quartzite, limestone, and dolomite are low-unit value, large-volume deposits, and must be amenable to open-pit mining, minimum processing, and shipping by truck or rail to nearby markets.

Table 2 summarizes domestic mine production and consumption, import sources and reliance, commodity prices, and uses of the major mineral commodities found in and near the study area.

MINES, PROSPECTS, AND MINERALIZED AREAS

Mines, prospects, and mineralized areas within the Diamond Peak study area are divided into two major categories, those associated with the Spring Mountain intrusive in the northern part of the study area and those associated with inferred magma bodies south of the Spring Mountain area (pl. 1). Both types occur near the base of the upper Medicine Lodge thrust plate in complexly folded and faulted Precambrian and Paleozoic calcareous sedimentary strata. Igneous dike rock was identified at a few locations south of Spring Mountain, at the Wilbert, Badger, and Badger King mines, and the Rainbow, Last Chance (Deusner tunnel), and South Creek Nos. 71-75 prospects. Beutner (1968, p. 16)

TABLE 2.--Summary of mineral commodities found in the Diamond Peak study area
(Commodity statistics are from U.S. Bureau of Mines Mineral Commodity Summaries - 1988)

Commodity	Domestic mine production,[1] 1987 (000)	Apparent consumption,[1] 1987 (000)	Units	Major import sources	Net import reliance, 1987[2] (percent)	Average 1987 domestic price (dollars)	Price unit	Major uses
Gold	4,900	2,800	Troy ounce	Canada Switzerland Uruguay	3/	$444.00	Troy ounce	Jewelry and arts, industrial (mainly electronic), and dental
Silver	38,000	144,000	do-----	Canada Mexico United Kingdom Peru	57	7.20	do----	Photography, electrical and electronic products, sterling ware, jewelry, brazing alloys and solders
Lead	330	1,130	Metric[4] ton	Canada Mexico Peru Australia	15	.36	Pound	Batteries, gasoline additives, construction, electrical, TV glass, paint, ceramics, ballasts, tubes, containers, type metal
Zinc	220	990	do-----	Canada Mexico Peru Australia	69	.42	do-----	Construction materials, transportation, machinery, electrical
Copper	1,270	2,190	do-----	Chile Canada Peru Mexico	25	.80	do-----	Building construction, electrical and electronic products, industrial machinery and equipment, transportation
Lime	15,200	15,363	Short tons	Canada Mexico	1	51.90	Short ton	Cement, lime, building stone, fluxes, glass, refractories, fillers, extenders, abrasives, chemicals, soil conditioners, aggregates.

TABLE 2.--Summary of mineral commodities found in the Diamond Peak study area--Continued

Commodity	Domestic mine production,[1] 1987 (000)	Apparent consumption,[1] 1987 (000)	Units	Major import sources	Net import reliance, 1987[2] (percent)	Average 1987 domestic price (dollars)	Price unit	Major uses
Iron ore	43.1	59.8	Long tons	Canada Brazil Venezuela Liberia	28	32.78	Long ton	Blast furnaces, direct reduction plant, steel furnaces, manufacture of cement, heavy media materials and other products.

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* All data for the year 1987

[1] Estimated data in millions of troy ounces for gold and silver; thousands of metric tons for lead, zinc, and copper; thousands of short tons for lime; and millions of long tons of ore for iron.

[2] Defined as imports minus exports plus adjustments for government and industry stock changes; a percent of apparent consumption.

[3] The U.S. is a net importer of gold; however, changes in unreported investor stocks preclude calculation of a meaningful net import reliance.

[4] Metric ton = 1.10 short tons = 2000 lb.

also reports igneous rocks in the Lucky Billy area, in Sunny Bar Canyon along the thrust fault, and on a ridge southeast of Bell Mountain.

Most mines and prospects in the Diamond Peak study area are predominantly in the Ordovician Summerhouse and Saturday Mountain Formations, and the Devonian Jefferson Formation. Prospects are also found in the Ordovician Kinnikinic Quartzite and in Precambrian phyllitic rocks. These sedimentary units trend northwest and regionally dip northeast. The mineral deposits are structurally controlled, and in the southern Lemhi Range occur in northwest trending shear and fault zones generally west of the Black Canyon thrust fault. In the northern portion of the study area, mineral occurrences are associated with the Trail Peak thrust and related faults.

Historic names of mines and prospects are used in this report; current or alternate names are in parentheses. Detailed descriptions of the principal mines in the study area are in appendix B. Descriptions of other mines and prospects are in appendix C. Appendix D contains maps and geochemical data for some of the mines and prospects in appendix C; miscellaneous sample data for remaining properties are listed in appendix E.

Trail Peak Area

Major producers of lead-, silver-, and copper-bearing minerals in the Spring Mountain mining district include the Excelsior, Iron Mask, and Red Warrior mines. The Elizabeth, Teddy, Lemhi-Union, and Silver Consolidated mines were major producers located more than a mile outside of the study area. These properties have vein and replacement deposits in shear and fault zones in the Devonian Jefferson and Ordovician Saturday Mountain Formations. Numerous Tertiary granitic dikes occur in the Trail Peak and Spring Mountain areas. Three igneous stocks occur 1 to 1 1/4 mi north of Trail Peak, including one with a marble halo just north of the Excelsior patent (Hait, 1965, pl. 1). No mineralized areas were observed to be associated with the marble/granitic contact. Approximately 6,700 tons of subeconomic indicated and inferred resources containing lead, silver, zinc, and gold were identified at the Excelsior mine. The resource apparently does not extend beyond the patent boundaries. No resources were identified at the Iron Mask, Red Warrior, and Dividend mines because there are no continuous ore bodies exposed that could be traced into the study area. However, similar geologic conditions exist elsewhere in the study area; these areas may warrant further investigation.

Basinger Canyon

Minor amounts of copper and silver were produced from the Copper Bluff mine in Basinger Canyon. Mineralized shear zones containing copper-, silver-, and lead-bearing minerals occur in the Kinnikinic Quartzite and Saturday Mountain Formations. No resources were identified because of the lack of exposed mineralized structures. In addition, complex faulting in the area may limit the extent of any mineralized structures that may exist.

Foss Mountain

Iron in hematite and magnetite replacement bodies occur at the Bell View mine and Iron Cap prospect; however, only the Iron Cap is in the study area. Hematite and magnetite are localized along shear zones in dolomite of the Saturday Mountain Formation. Mining claimants report 7,000 tons of iron ore and 400 tons of manganese were produced from the Bell View mine since 1963. USBM estimated about 6,000 tons of subeconomic indicated resources are in place in the exposed iron replacement bodies; about 3,500 tons of iron ore are on the dump. U.S. Steel Corporation estimated 7,500 tons of indicated and 10,000 tons of inferred resources were present. (See BLM patent application I-18847.) Iron deposits could not be traced to the Iron Cap prospect; further exploration would be necessary to determine whether additional iron resources exist.

Badger Creek

The major mines of the Hamilton mining district are located in the Badger Creek area. The Badger mine in Bunting Canyon was the major producer, but ore bodies are apparently mined out. At the Badger, Automatic, and Valley View mines, and the Lucky Strike, Little Pittsburgh, Last Chance, and other prospects, oxidized and leached lead, silver, and zinc vein and massive replacement deposits with small amounts of copper-bearing minerals occur in the Saturday Mountain Formation. Plattnerite, a lead oxide, is disseminated in fractures and shear zones in the Kinnikinic Quartzite at the Valley View mine.

The properties in the Badger Creek area are in the lower plate of the Badger Creek thrust fault. Dikes, evidence of igneous activity, occur at the Badger and Badger King mines, and the Last Chance (Deusner tunnel) and Rainbow prospects. No resource estimates were made at the major properties because of limited extent and low grade of mineralized bodies. Mineralized structures could not be traced into the study area; however, similar geological conditions exist within the study area, and certain areas may warrant further investigation.

Some prospects occur in limestone of the White Knob Group in the Horse Creek glide (detachment) block; no extensive mineralized zones were found. However, samples containing anomalous metal concentrations may indicate mineralization at depth.

Uncle Ike Creek

The Copper Mountain mine, located in Uncle Ike Creek, produced a small amount of copper-bearing ore. However, resources could not be evaluated because all underground workings are caved, and not enough of the mineralized structure is exposed on the surface. The structure could not be traced beyond the mine area, but mineralization was found at the Copper Mountain No. 8 prospect about 1/2 mi to the south and at the Big Horn and Whitebird mines in Mormon Gulch. At the UI Nos. 6 and 7 prospect, copper-, silver-, and gold-bearing minerals occur in quartz vein material in Precambrian phyllitic quartzite, probably Gunsight Formation. These mineralized rocks are similar to the Precambrian rocks

explored at the Lucky Billy and South Creek Nos. 71-75 prospects. Further exploration of the Uncle Ike Creek area may be warranted to determine if mineralization indicates resources at depth.

Mormon Gulch

The Bighorn and Whitebird mines are located on either side of the Black Canyon thrust fault between Ordovician limestone and dolomite and Middle Canyon limestone and shale. Shear zones at both properties contain vein material with argentiferous galena, secondary lead and zinc minerals, and iron oxide minerals. The main workings are inaccessible. Previous studies identified about 2,000 tons of inferred resources containing lead- and silver-bearing minerals at the Bighorn Mine and about 1,500 tons of indicated and inferred resources containing lead-, zinc-, and silver-bearing minerals at the Whitebird mine (Shaffer, 1943 and Taber, 1949). These resources could not be traced into the study area, although similar geology and structures exist to the north and south.

North Creek

At the Johnson prospect and Sentinel mine, lead- and zinc-bearing minerals occur as veins and pods, and are disseminated in shear zones in Jefferson and Saturday Mountain dolomite. Galena is also disseminated in dolomite and quartzite wallrock.

The two properties are about 1/2 mi west of the Black Canyon thrust fault. An estimated 37,500 tons of subeconomic indicated and inferred resources were identified at the Sentinel mine, outside the study area, but could not be traced to the Johnson prospect which is inside the study area. Further investigation is necessary to determine if additional resources exist at depth along the east flank of an anticlinal structure between the two properties. Similar rock types and mineralized shear zones occur to the north at Mormon Gulch, and to the south at the Waymire and Camp Creek prospects.

Lead and silver were produced at the Wilbert mine from 1906 to 1982. This property is about 1 mi west of the study area boundary, and includes about 145 acres of patented property in the Summerhouse Formation. Lead- and silver-bearing minerals occur in veins in shear zones transecting dolomitic quartzite, and as replacements in dolomite. Resources were not estimated because the property is too far from the study area, and extensions of the mineralization are not evident. However, previous work by USBM indicates that as much as 7,000 tons of vein material might be found with further drilling, even though the main ore bodies are mined out (Shaffer, 1945). Field observations and sampling results of this study confirm the presence of low-grade lead, silver, and zinc in shear zones and wallrock. Dumps on the Wilbert property were reworked between 1945 and 1968, and are now essentially barren.

Mineral deposits similar to those at the Wilbert mine occur to the south at the Lookout mine, outside the study area, and the Great Western mine, inside the study area. Additional examination may be warranted to

determine if similar resources exist between the Wilbert, the Lookout, and the Great Western mines.

Camp Creek

The Lookout mine is part of the Wilbert patent, and production of lead and silver from this mine was included with the Wilbert mine. A fault zone containing argentiferous galena and secondary lead and zinc minerals in the Summerhouse Formation was mined. The main ore body is mined out, but shear zones contain low-grade lead and silver. Mineralized structures could not be traced between the Lookout and Wilbert mines, but further evaluation may reveal additional resources.

Lead, silver, and copper were produced at the Great Western mine from 1907 to 1960. Vein and replacement bodies pinch and swell in shear zones in dolomitic quartzite of the Summerhouse Formation. Lead, silver, copper, and zinc are also disseminated within the shear zones and wallrock. In 1986 and 1987, silver was mined by a two-man operation using underground hand-resuing methods, and concentrates were shipped to a mill and smelter; the mine was inactive in 1988. Approximately 4,900 tons of subeconomic indicated resources were estimated in the existing underground workings. Further detailed examination may reveal additional resources laterally and at depth.

Shear and fracture zones in the Saturday Mountain Formation at other prospects in the Camp Creek area contain anomalous concentrations of lead and zinc. Additional field work would be necessary to determine the significance of these anomalies.

South Creek

The Ajax mine is the only known producer in the South Creek area. Galena and secondary lead minerals containing silver occur in shears and fractures in the Kinnikinic Quartzite. This occurrence is similar to the Valley View mine near Badger Creek. No resources were estimated because of low grade of the occurrence. Additional work would be necessary to determine whether mineralization occurs at depth.

All other prospects in the South Creek area explore minor mineralized zones in faults, shears, and fractures in the Summerhouse, Wilbert, and Swauger Formations. Low grade and anomalous lead, silver, copper, and zinc suggest mineral occurrences laterally and at depth.

Black Canyon

Miscellaneous prospects with anomalous lead, zinc, silver, and copper occur at the Protection and San Francisco prospects in Black Canyon, and at the BC prospects on the divide between Black and Middle Canyons. Shear and fault zones contain disseminated lead- and zinc-bearing minerals with minor copper and silver in the Summerhouse, Kinnikinic, Saturday Mountain, Jefferson, and Middle Canyon Formations. No resources were estimated because of low grades and lack of extent of mineralized structures. Additional study is necessary to determine the significance of these isolated occurrences.

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Lead, silver, and copper were produced at the Great Western mine from 1907 to 1960. Vein and replacement bodies pinch and swell in shear zones in dolomitic quartzite of the Summerhouse Formation. Lead, silver, copper, and zinc are also disseminated within the shear zones and wallrock. In 1986 and 1987, silver was mined by a two-man operation using underground hand-mining methods, and concentrates were shipped to a mill and smelter; the mine was inactive in 1988. Approximately 4,900 tons of subeconomic indicated resources were estimated in the existing underground workings. Further detailed examination may reveal additional resources laterally and at depth.

Shear and fracture zones in the Saturday Mountain Formation at other prospects in the Camp Creek area contain anomalous concentrations of lead and zinc. Additional field work would be necessary to determine the significance of these anomalies.

South Creek

The Ajax mine is the only known producer in the South Creek area. Galena and secondary lead minerals containing silver occur in shears and fractures in the Kinnikinic Quartzite. This occurrence is similar to the Valley View mine near Badger Creek. No resources were estimated because of the grade of the occurrence. Additional work would be necessary to determine whether mineralization occurs at depth.

All other prospects in the South Creek area explore minor mineralized zones in faults, shears, and fractures in the Summerhouse, Wilbert, and Banner Formations. Low grade and anomalous lead, silver, copper, and zinc suggest mineral occurrences laterally and at depth.

Other Areas

Miscellaneous prospects with anomalous lead, zinc, silver, and copper occur at the Protection and San Francisco prospects in Black Canyon, and at the BC prospects on the divide between Black and Middle Canyons. Shear and fault zones contain disseminated lead- and zinc-bearing minerals with minor copper and silver in the Summerhouse, Kinnikinic, Saturday Mountain, Jefferson, and Middle Canyon Formations. No resources were estimated because of low grades and lack of extent of mineralized structures. Additional study is necessary to determine the significance of these isolated occurrences.

Targhee National Forest

The principal mines and prospects in the Targhee portion of the Diamond Peak study area are in the Trail Peak area. Only minor prospects were found on the east side of the Lemhi Range in Carboniferous unnamed limestones, the Milligen Formation, and the White Knob Group. Tertiary rhyolite that may be suitable for decorative stone occurs at the Bighorn Canyon and VJ prospects adjacent to the study area. Tertiary rhyolite outcrops were reported by Beutner (1968, pl. 1) within the study area in sections 20, 29, and 30, T.10 N., R.29 E.

Staatz and others (1982) identified sections 20, 29, and 32 in T.7 N., R. 30 E. as "lands prospectively valuable for phosphate." This area is located east of Saddle Mountain in Pennsylvanian and Permian unnamed limestone, sandstone, and quartzite. Phosphate beds occur in the Permian Phosphoria Formation in Idaho (Cathcart and Gulbrandsen, 1973, p. 519). However, the Phosphoria Formation was not noted in the study area during this investigation. Additional work would be necessary to establish the presence and nature of phosphate occurrences in the study area.

Other Sample Localities

Twenty-five alluvial placer samples were collected from several major drainages to determine whether heavy minerals or gold occur on the east side of the Lemhi Range (pl. 1). No gold or other metallic minerals were found in the concentrates collected.

Ten lode samples were collected from shear zones in carbonate rocks containing iron oxide minerals and calcite in the vicinity of Diamond Peak, Foss Mountain, Saddle Mountain, Coal Kiln Canyon, and Horse Creek (pl. 1). Seven samples contained lead and zinc concentrations between 2 times average crustal abundance and 0.5 percent (table E-2).

APPRAISAL OF MINERAL RESOURCES

Within the Diamond Peak study area, mineral resources were identified at the Great Western and Excelsior mines. Outside the study area resources were identified at the Sentinel mine in North Creek. Mineral resources were also identified at the Wilbert mine in North Creek, the Bighorn and Whitebird mines in Mormon Gulch, the Bell View mine on Foss Mountain, and the Automatic mine in Badger Creek. Resources at the Sentinel mine are classified as subeconomic based on 1988 metal prices because of small size and low grade of the mineralized structures. A significant increase in metal prices or additional resources could make mining feasible. Preliminary cost estimates show that mine operating costs alone would not preclude small-scale mining by underground hand-resuing methods when contract or used equipment were utilized (Stebbins, 1989, personal communication). Ore could be shipped by truck and rail to the mill at Kellogg, Idaho and the smelter in East Helena, Montana (Camm, 1988, written communication).

Identified resources and mineralized zones in the above-mentioned mines may extend into the study area. Geologic structures and rock

types similar to those found at these mines, and anomalous metal concentrations at prospects in the study area may indicate additional resources. Detailed investigations beyond the scope of this study would be necessary to establish the presence or absence of additional resources within the study area.

In the Challis portion of the Diamond Peak study area, mineralization principally occurs along shear zones in northeast-trending drainages. The drainages may locally follow transverse faults along which mineralized fluids are concentrated at or near junctions with northwest-trending thrust faults (fig. 2). Such areas include South Creek, Alder Gulch, Camp Creek, North Creek, Mormon Gulch, Uncle Ike Creek, Bell Mountain Creek, Badger Creek, Deep Creek, and Warm Creek (pl. 1). The field investigation did not find evidence for significant mineralization between northeast-trending drainages along the northwest-trending structures. Additional studies would be necessary to: 1) determine if mineralization is in fact controlled by northeast faults, and 2) examine other northeast trending drainages for mineralized structures.

Metallic minerals in the Diamond Peak study area occur in structurally prepared rocks above the Medicine Lodge thrust fault. In the Trail Peak area, the most likely source of metals is the granitic intrusions. South of Trail Peak, the source of metals may be inferred buried intrusives. However, carbonate rocks containing anomalous amounts of disseminated metals may also be a source. Further examination would be necessary to determine the source of metallic minerals in the study area.

Veins and replacement bodies at mines and prospects have been extensively leached and oxidized, and contain large amounts of zinc. Additional exploration would be necessary to determine if a zone of supergene enrichment may occur below the oxidized zone.

Lambeth and Mayerle suggest that lead, silver, and zinc deposits in the Devonian Jefferson Formation in the Birch Creek mining district are stratabound (Skipp and others, 1983). This district is about 15 mi east of the Lemhi Range in the Beaverhead Mountains. Accordingly, numerous occurrences of mineralized zones in carbonate sedimentary units, particularly in Ordovician and Devonian strata below the Kinnikinic Quartzite in the study area may be indicative of stratabound mineral occurrences. For example, ore at the Wilbert and Great Western mines appears to fit the criteria (Hagni, 1976, p. 488) for these types of deposits, specifically, carbonate host rock, quartzite cap rock, a major fault (i.e. the Black Canyon thrust fault), another major structure (Lemhi Arch) west of the Lemhi Range, and an inferred buried intrusive body. Additional studies would be necessary to determine whether stratabound mineral occurrences occur in the study area.

Metallic mineral deposits in the Diamond Peak study area were classified by the U.S. Geological Survey (USGS) as part of a forest-wide study of the Challis National Forest (Worl and others, 1989). The area from the Copper Mountain mine in Uncle Ike Creek to the mouth of Black Canyon was classified as having "moderate potential for

polymetallic veins in quartzite." This includes the area around the Wilbert mine which has a "high potential" for this deposit type. Another area of "moderate potential for the occurrence of polymetallic-bearing veins in quartzite" was reported between Badger Creek and Fowler Springs north of Boulder Canyon. This area includes mines and prospects north and south of the mouth of Badger Creek Canyon, and the Badger and Automatic mines, and the Lucky Strike prospect. An area of undetermined potential was reported west of the Wilbert mine. It contains an aeromagnetic high, that may be indicative of a buried intrusive, the source for mineralization in the Dome mining district. (See Worl and others, 1989.)

In the Trail Peak area, a "high potential for polymetallic veins in carbonate-rocks" was reported by Worl and others (1989). Within the area of high potential, a smaller area of "moderate potential for polymetallic skarn deposits" was also noted. This area includes the Excelsior, Red Warrior, Iron Mask, and Dividend mines, and the Hope prospect. The area surrounding Spring Mountain was assigned "moderate potential for polymetallic veins in carbonate rock, and moderate potential for irregular replacements by base and precious metal deposits." These areas include the eastern portion of Warm Creek and the Mammoth Canyon prospects area. An area of unknown potential for base and precious metals as replacements in carbonates and quartzites near a felsic pluton was delineated west of the areas of moderate potential. The Warm Creek prospect is located in this area. (See Worl and others, 1989.)

Recommendations for Further Study

Additional geochemical and geophysical work and drilling are recommended in the Diamond Peak study area at the Great Western and Excelsior mines. Further investigation is needed at mines and prospects outside the study area with resources and mineral occurrences to determine size, extent, and grade of additional resources; and to determine whether resources and mineralized zones extend into the study area.

A background geochemical survey is recommended to determine whether apparently anomalous metal concentrations (more than twice crustal abundance) in fractured and jointed country rock around known mines and prospects are actually normal background amounts for the Diamond Peak area.

Drilling of known metallic deposits is recommended to determine if additional resources occur in zones of supergene enrichment below zones of oxidation.

Further investigation in the Trail Peak area is necessary to determine whether skarn-type mineralization occurs within study area boundaries.

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APPENDIX A.--ANALYTICAL METHODS, RESOURCE DEFINITIONS, AND STRATIGRAPHIC CORRELATION CHART

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A-3. Correlation of stratigraphic units in the Lemhi Range 29

TABLE A-1.--Laboratory methods used by Chemex Labs for geochemical and ore grade analyses

Element	Units	Method	Detection limit Lower	Detection limit Upper
Au	ppb	FA-AA	5.0 ppb	10 ppm
Ag	ppm oz/ton	AR AR-AA or FA	0.1 ppm 0.01 oz/ton	200 ppm
Pb, Zn, Cu	ppm percent	ICP-AES AA	1.0 ppm 1.0 percent	10000 ppm
Ge	ppm	ICP-AES	5.0 ppm	10000 ppm
Mo	ppm	ICP-AES	1.0 ppm	10000 ppm
Sb	ppm	ICP-AES	1.0 ppm	10000 ppm
Ar	ppm	ICP-AES	1.0 ppm	10000 ppm

FA-AA: Fire assay plus atomic absorption spectroscopy
AR: Aqua regia
ICP-AES: Inductively coupled plasma plus atomic emission spectroscopy

To convert ppm analyses to oz/ton, multiply ppm by 0.0292 oz/ton.
To convert ppm analyses to %, divide ppm by 10,000 ppm.

TABLE A-2.--RESOURCE/RESERVE DEFINITIONS
(U.S. Bureau of Mines and U.S. Geological Survey, 1980)

RESOURCE.--A concentration of naturally occurring solid, liquid, or gaseous material in or on the Earth's crust in such form and amount that economic extraction of a commodity from the concentration is currently or potentially feasible.

IDENTIFIED RESOURCES.--Resources whose location, grade, quality, and quantity are known or estimated from specific geologic evidence. Identified resources include economic, marginally economic, and subeconomic components. To reflect varying degrees of geologic certainty, these economic divisions can be subdivided into measured, indicated, and inferred.

DEMONSTRATED.--A term for the sum of measured plus indicated.

MEASURED.--Quantity is computed from dimensions revealed in outcrops, trenches, workings, or drill holes; grade and (or) quality are computed from the results of detailed sampling. The sites for inspection, sampling, and measurement are spaced so closely and the geologic character is so well defined that size, shape, depth, and mineral content of the resource are well established.

INDICATED.--Quantity and grade and (or) quality are computed from information similar to that used for measured resources, but the sites for inspection, sampling, and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for measured resources, is high enough to assume continuity between points of observation.

INFERRED.--Estimates are based on an assumed continuity beyond measured and (or) indicated resources, for which there is geologic evidence. Inferred resources may or may not be supported by samples or measurements.

RESERVE BASE.--That part of an identified resource that meets specified minimum physical and chemical criteria related to current mining and production practices, including those for grade, quality, thickness, and depth. The reserve base is the in-place demonstrated (measured plus indicated) resource from which reserves are estimated. It may encompass those parts of the resources that have a reasonable potential for becoming economically available within planning horizons beyond those that assume proven technology and current economics. The reserve base includes those resources that are currently economic (reserves), marginally economic (marginal reserves), and some of those that are currently

subeconomic (subeconomic resources). The term "geologic reserve" has been applied by others to the reserve-base category, but it also may include the inferred-reserve-base category; it is not a part of this classification system.

RESERVES.--That part of the reserve base which could be economically extracted or produced at the time of determination. The term reserves need not signify that extraction facilities are in place and operative. Reserves include only recoverable materials, thus, terms such as "extractable reserves" and "recoverable reserves" are redundant and are not included in this classification system.

MARGINAL RESERVES.--That part of the reserve base which, at the time of determination, borders on being economically producible. Its essential characteristic is economic uncertainty. Included are resources that would be producible, given projected changes in economic or technologic factors.

ECONOMIC.--This term implies that profitable extraction or production under defined investment assumptions has been established, analytically demonstrated, or assumed with reasonable certainty.

SUBECONOMIC RESOURCES.--The part of identified resources that does not meet the economic criteria of reserves and marginal reserves.

UNDISCOVERED RESOURCES.--Resources, the existence of which are only postulated, comprising deposits that are separate from identified resources. Undiscovered resources may be postulated in deposits of such grade and physical location as to render them economic, marginally economic, or subeconomic.

OTHER OCCURRENCES.--Materials that are too low grade or for other reasons are not considered potentially economic, in the same sense as the defined resource, may be recognized and their magnitude estimated, but they are not classified as resources. The boundary between subeconomic and other occurrences is limited by the concept of current or potential feasibility of economic production, which is required by the definition specified in terms of grade, quality, thickness, depth, percent extractable, or other economic-feasibility variables.

TABLE A-3.--Correlation of stratigraphic units in the Lemhi Range

		Ross (1961)	Hait (1965)	Beutner (1968)		Ruppel (1978) Ruppel and others (1981)		Hobbs and others (1968) (Bayhorse area)
CENOZOIC	QUATERNARY	Landslide Silt Alluvium Glacial Snake River Basalt	Mass wasting Alluvium Fan gravels Glacial Snake River Basalt	Landslide Alluvium Fan Silt Glacial Volcanics				
	TERTIARY	Tuff and alluvium Lava/volcanics	Tuff and limestone Edie School Rhyolite Limestone Challis volcanics	Older alluvium Rhyolite Limestone Lava				
PALEOZOIC	PERMIAN			Unnamed limestone	White Knob Group	Unnamed ls & ss		
	PENNSYLVANIAN			Unnamed quartzite		Unnamed ls & ss		
	MISSISSIPPIAN	Brazer Limestone Milligen Fm	White Knob Fm Milligen Fm	Surrett Canyon Fm South Creek Fm Scott Peak Fm Middle Canyon Fm Lower member		Surrett Canyon Fm South Creek Fm Scott Peak Fm Middle Canyon Fm Milligen Fm		
	DEVONIAN	Three Forks Limestone	Three Forks Fm Jefferson Fm	Three Forks Fm Jefferson Fm		Three Forks Fm Jefferson Fm Channel Sandstone		
	SILURIAN		Laketown Dolomite			Laketown Fm		
	ORDOVICIAN	Saturday Mountain Fm Kinnikinic Quartzite	Fish Haven Dolomite Kinnikinic Quartzite	Fish Haven Dolomite Kinnikinic Quartzite		Saturday Mountain Fm Kinnikinic Quartzite Summerhouse Fm		Ella Dolomite Clayton Mine Quartzite
	CAMBRIAN (?)			Unnamed qt, do, ss Upper Middle Lower				Cash Creek Quartzite Unnamed do & ls Unnamed Quartzite
PROTEROZOIC	PRECAMBRIAN	Swauger Quartzite	Belt Group	Belt Supergroup		Wilbert Fm Swauger Fm Gunsight Fm Apple Creek Fm Big Creek Fm West Fork Fm Inyo Creek Fm Yellowjacket Fm	Lemhi Group	

ABBREVIATIONS

Fm = Formation
ls = Limestone
ss = Sandstone
do = Dolomite
qt= Quartzite

NOTE: Carboniferous is equivalent to Mississippian and Pennsylvanian

APPENDIX B.--DESCRIPTIONS OF MAJOR MINES IN OR NEAR THE DIAMOND PEAK STUDY AREA

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Great Western mine 88

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B-6. Sample data and descriptions for the Great Western mine 103

NAME: Excelsior mine

AKA: Winnie, Constance

OWNER: Excelsior Mining Co., R. S. Johnson, Salt Lake City, UT 84110

MAP NO.: Plate 1, No. 5

LOCATION: E1/2 sec. 28 and S1/2S1/2 sec. 21, T. 12 N., R. 27 E.

ELEVATION: 8,800 to 10,000 ft

ACCESS: By State Highway 28 about 24 mi south from Leadore, ID, 8 mi south of Gilmore then 4 mi southwest by Spring Mountain Canyon road, then south for 1 mi into Horseshoe Gulch by unimproved dirt road, then east for approximately 0.5 mi by foot trail.

HISTORY: The Excelsior was one of five lode claims (Excelsior Nos. 1-5) located by L. Pense and others in 1880. Little is known of the early history of this claim group except to say that it was probably located for lead-silver, and was one of the most active claims in the newly formed Spring Mountain mining district. By the early 1900's, the Excelsior Mining Company was formed and had acquired neighboring claims which included the Winnie, Constance, War Eagle, Annex, Pay Rock, Relief, Apex, Weiss and Newport claims.

The property was patented in 1913, along with two millsites, and operated on a small-scale, intermittent basis through 1949. Reliable production records prior to 1901 are not available. Between 1901 and 1949, USBM production records indicate more than 1,100 tons of ore were shipped from the Excelsior property containing from 7 to 35 percent lead, 2 to 30 oz/ton silver, 0.03 to 3 percent copper, and 0.3 to 0.26 oz/ton gold.

GEOLOGY: The workings are in limestone and dolomite of the Devonian Jefferson Formation east of the Horseshoe Gulch normal fault and below the Trail Peak thrust fault in the lower plate (fig. B-1)(Hait, 1965, pls. 1 and 2). Northwest-trending shears and faults, and northeast-trending bedding plane shears are brecciated and silicified. These silicified shear zones contain veins composed of lead, silver, and zinc minerals with associated copper and gold. Leaching and oxidation have altered vein material into masses of limonite filled with secondary lead, silver, and zinc minerals; some galena and sphalerite are present. Dolomite and limestone wallrock also contain disseminated lead, zinc, and silver minerals. A small intrusive stock surrounded by a halo of marble was reported by Hait (1965, pl. 1) on the ridge just north of the patent boundary. The lower caved workings at the northern end of the patent are near or at the contact between the marble and the Jefferson Formation.

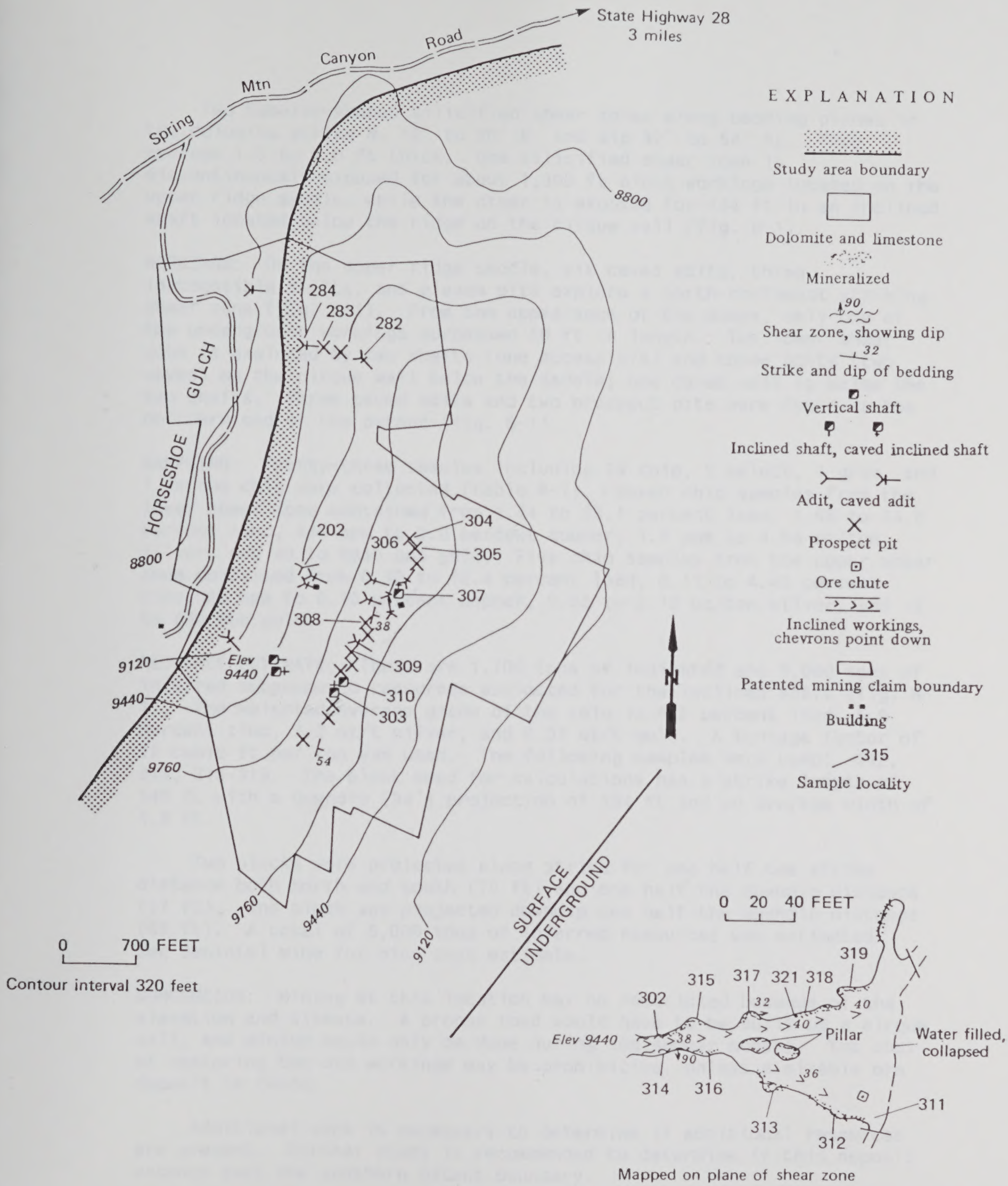

State Highway 28
3 miles
Spring Mtn Canyon Road
EXPLANATION
Study area boundary
Dolomite and limestone
Mineralized
90
Shear zone, showing dip
32
Strike and dip of bedding
Vertical shaft
Inclined shaft, caved inclined shaft
Adit, caved adit
Prospect pit
Ore chute
Inclined workings, chevrons point down
Patented mining claim boundary
Building
315
Sample locality
HORSESHOE GULCH
8800
9120
9440
9760
284
283
282
202
304
306
305
307
308
38
309
310
303
54
Elev 9440
N
SURFACE
UNDERGROUND
0 700 FEET
Contour interval 320 feet
0 20 40 FEET
302
315
317
321
318
319
32
40
40
38
90
36
Elev 9440
Pillar
Water filled, collapsed
314
316
313
312
311
Mapped on plane of shear zone

FIGURE B-1.– Surface and underground map of inclined shaft, Excelsior mine

Two tabular-shaped silicified shear zones along bedding planes in the dolomite strike N. 12° to 20° E. and dip 32° to 54° SE. They average 1.5 to 2.0 ft thick. One silicified shear zone is discontinuously exposed for about 1,300 ft along workings located on the upper ridge saddle, while the other is exposed for 134 ft in an inclined shaft located below the ridge on the cirque wall (fig. B-1).

WORKINGS: On the upper ridge saddle, six caved adits, three inaccessible shafts, and eleven pits explore a north-northeast striking shear zone (fig. B-1). From the appearance of the dumps, only one of the underground workings surpassed 50 ft in length. The lower shear zone is explored by two shafts (one accessible) and three adits (two caved) on the cirque wall below the saddle; one caved adit is below the two shafts. Three caved adits and two prospect pits were found at the northern end of the patent (fig. B-1).

SAMPLING: Twenty-three samples including 19 chip, 2 select, 1 grab, and 1 random chip were collected (table B-1). Seven chip samples from the lower shear zone contained from 1.44 to 23.1 percent lead, 1.68 to 14.8 percent zinc, 440 ppm to 2.0 percent copper, 1.9 ppm to 4.84 oz/ton silver, and 40 to 9850 ppb gold. Five chip samples from the upper shear zone contained from 0.10 to 12.4 percent lead, 0.11 to 4.43 percent zinc, 25 ppm to 0.10 percent copper, 0.02 to 2.72 oz/ton silver, and <5 to 830 ppb gold.

RESOURCE ESTIMATE; There are 1,700 tons of indicated and 5,000 tons of inferred subeconomic resources estimated for the inclined shaft (fig. B-1). The weighted average grade of the vein is 8.9 percent lead, 5.9 percent zinc, 2.2 oz/t silver, and 0.07 oz/t gold. A tonnage factor of 12 cubic ft per ton was used. The following samples were used: 312, 313, 315-319. The block used for calculations has a strike length of 140 ft with a downdip (34°) projection of 134 ft and an average width of 1.6 ft.

Two blocks were projected along strike for one half the strike distance both north and south (70 ft) and one half the downdip distance (67 ft). One block was projected downdip one half the downdip distance (67 ft). A total of 5,000 tons of inferred resources was estimated. See Senintel mine for mine cost estimate.

CONCLUSION: Mining at this location may be restricted because of the elevation and climate. A proper road would have to be built up a cirque wall, and mining could only be done during the summer months. The cost of restoring the old workings may be prohibitive, unless a sizable ore deposit is found.

Additional work is necessary to determine if additional resources are present. Further study is recommended to determine if this deposit extends past the southern patent boundary.

TABLE B-1.--Sample data and descriptions for the Excelsior mine

(Assay values in oz/ton, percent, ppm, or ppb unless otherwise noted: >, greater than)

Sample				Analyses				
No.	Type	Length (ft)	Description	Gold (ppb)	Silver (oz/ton)	Copper (ppm)	Lead (%)	Zinc (%)
202	Chip	6.0	Silicified alteration zone in dolomite containing iron oxide minerals, quartz, and calcite blebs and stringers.	70	0.31	172	0.79	0.94
282	Select	--	Silicified dolomite with iron oxide minerals, quartz, calcite, disseminated galena in quartz.	60	3.62	102	4.86	.96
283	Random chip	--	Dolomite country rock containing iron oxide and calcite along fractures.	10	.9 ppm	17	390 ppm	630 ppm
284	Chip	4.0	Breccia zone in dolomite containing iron and manganese oxide minerals.	15	.88	61	.11	.17
302	do.	4.0	Silicified breccia zone in dolomite.	<5	5 ppm	135	.24	.58
303	do.	6.0	Silicified and altered dolomite zone containing bull quartz, galena, sphalerite, secondary copper minerals, and iron and manganese oxides.	.015 oz/ton	1.9	.25%	6.14	5
304	do.	2.0	Silicified breccia zone in dolomite with minor calcite and iron oxide minerals along fractures.	65	.61	173	.84	1

TABLE B-1.--Sample data and descriptions for the Excelsior mine--Continued

Sample				Analyses				
No.	Type	Length (ft)	Description	Gold (ppb)	Silver (oz/ton)	Copper (ppm)	Lead (%)	Zinc (%)
305	Grab	--	Silicified dolomite breccia containing galena, calcite, and iron oxide minerals.	30	0.53	95	3.89	3.21
306	Chip	2.5	Silicified dolomite breccia with calcite and iron oxide minerals.	<5	.7 ppm	25	.10	.25
307	do.	2.0	Complex breccia shear zone containing vuggy quartz, calcite, and iron oxide minerals.	30	.9 ppm	115	.48	.11
308	do.	1.5	Vein along dolomite bedding plane containing hematite, limonite, geothite, galena, and calcite along fractures.	0.024 oz/ton	2.72	.10%	12.4	4.11
309	Select	--	Dolomite containing iron oxide minerals.	.018 oz/ton	24.4	830	6.04	1.77
310	Chip	2.5	Silicified breccia zone in dolomite containing galena and iron oxide minerals.	.022 oz/ton	1.46	740	8.09	4.43
311	do.	4.2	Silicified zone in dolomite containing galena crystals, iron oxide minerals, and clay gouge.	.069 oz/ton	1.43	.31%	13.9	3.31
312	do.	2.2	Breccia zone in dolomite containing limonite, other iron oxides, and calcite veinlets; strikes N. 12° E. and dips 36° SE.	40	1.9 ppm	.11%	1.44	1.68

TABLE B-1.--Sample data and descriptions for the Excelsior mine--Continued

Sample				Analyses				
No.	Type	Length (ft)	Description	Gold (ppb)	Silver (oz/ton)	Copper (ppm)	Lead (%)	Zinc (%)
313	Chip	1.8	Breccia zone containing 10 to 20 percent galena and calcite.	170	2.77	440	12	4.6
314	do.	3.5	Breccia zone containing calcite in dolomite.	10	1.0 ppm	4.5	.16	.13
315	do.	2.0	Breccia zone along bedding plane in dolomite.	0.05 oz/ton	4.66	1.69%	5	14.8
316	do.	1.0	Breccia zone with limonite, other iron oxides, and manganese coating.	200	.51	.56%	2.91	4.5
317	do.	1.0	Silicified breccia zone with limonite/geothite and clay gouge, strikes N. 15° W. and dips 32° NE. in dolomite.	.02 oz/ton	3.7 ppm	>1%*	3.13	3.19
318	do.	1.0	Silicified breccia zone containing limonite and secondary copper minerals, with silicified fragments of dolomite.	.089 oz/ton	4.84	2%	10.8	3.10
319	do.	2.0	Breccia zone along dolomite bedding plane with iron oxides, secondary copper minerals, calcite, clay, and dolomite fragments.	.288 oz/ton	2.28	.30%	23.1	6.52
321	do.	4.0	Silicified zone in dolomite	.214 oz/ton	2.34	2.44%	2.45	10.4

* Not analyzed for ore grade

NAME: Badger mine (outside)

AKA: Bunting property; Rosebud; Lucky Seven

OWNER: Wilma Davis, Iona, ID 83427

MAP NO. Plate 1, No. 34

LOCATION: SESW sec. 16, T. 9 N., R. 28 E.

ELEVATION: 7,420 to 8,240 ft

ACCESS: From Howe, ID, take the Pahsimeroi Road (Little Lost River Valley Road) north 21 mi; take a jeep trail 6 mi northeast to Bunting Canyon; then take a deeply rutted mine road that switchbacks up the ridge to the main workings.

HISTORY: The first mining claim activity along Badger Creek took place in the 1880's with the discovery of mineralized zones at the mouth of the creek, and later, the discovery of the Badger mine. Ross (1961, p. 253, 249) reports that much of the production from the Hamilton mining district came from the Badger mine (table 1). USBM mineral production files show more than 550 tons of ore containing as much as 37 percent lead and 29 oz/ton silver with minor amounts of copper and gold were produced intermittently between 1910 and 1948. Bell (1912, p. 30) reports that 2,000 tons containing 60 percent lead had been produced prior to 1911.

GEOLOGY: Lead, silver, and zinc deposits occur as replacement pods and veins in dolomite of the Ordovician Saturday Mountain Formation. Ore bodies are found associated with shear zones; some faulting also took place after ore deposition. The ore bodies appear to be irregular massive replacement bodies that have undergone extensive leaching. Very little primary sulfides remain, only minor galena and possibly sphalerite. The main constituents of the ore deposit are secondary lead, zinc, and iron oxides in siliceous limonite boxworks with minor copper. Limonitic psuedomorphs after pyrite also occur in the ore body. Three stopes in the main adit cover an area of mineralization of about 240 ft by 100 ft. The main stope is about 40 ft long and 80 ft high. All stopes are mined out. The fault or conduit along which replacement took place strikes about N. 45° W. and dips 35 to 50° NE. USBM sampling shows anomalous amounts of lead, zinc, and copper in the wallrock. Veinlets of siliceous limonite and jasperoid pods are found in dolomite host rock in the rest of the main adit.

According to Beutner (1968, pls. 1 and 2), the mine is located in the lower plate of the Badger Creek thrust fault. The shaft at the southern end of the property is at the Badger Creek thrust fault contact between the Saturday Mountain dolomite and possibly Gunsight argillite (fig. B-2). The northernmost working is in Kinnikinic Quartzite at the contact with the Saturday Mountain Formation. A granodiorite dike is exposed at a caved adit (fig. B-2). This is one of the few localities south of Spring Mountain where intrusive rock was observed and evidence of magmatic activity is found.

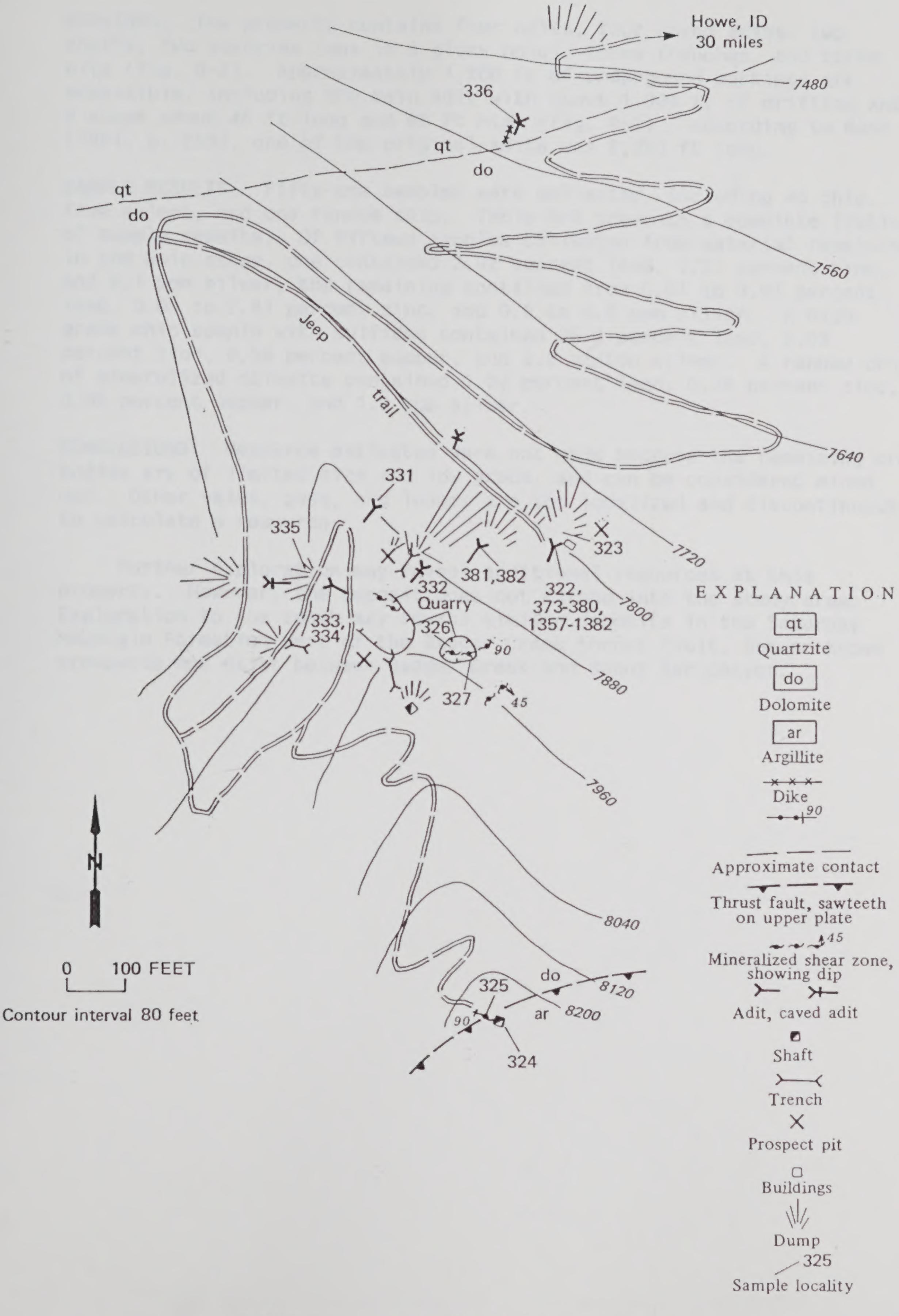

Howe, ID
30 miles
7480
336
qt
do
qt
do
7560
Jeep trail
7640
331
335
323
7720
381,382
322,
373-380,
1357-1382
332
Quarry
7800
333,
334
326
90
327
7880
45
7960
8040
0 100 FEET
Contour interval 80 feet
325
do
8120
90
ar
8200
324
EXPLANATION
qt
Quartzite
do
Dolomite
ar
Argillite
Dike
90
Approximate contact
Thrust fault, sawteeth on upper plate
45
Mineralized shear zone, showing dip
Adit, caved adit
Shaft
Trench
Prospect pit
Buildings
Dump
325
Sample locality

FIGURE B-2.– Surface map, Badger mine

WORKINGS: The property contains four adits, four caved adits, two shafts, two quarries (one is a glory hole), three trenches, and three pits (fig. B-2). Approximately 1,200 ft of undergound workings are accessible, including the main adit with about 1,000 ft of drifting and a stope about 40 ft long and 80 ft high (fig. B-3). According to Ross (1961, p. 253), one of the original adits was 2,350 ft long.

SAMPLE RESULTS: Fifty-one samples were collected, including 45 chip, five select, and one random chip. Table B-2 presents a complete listing of sample results. Of fifteen samples collected from material remaining in the main stope, one contained 2.92 percent lead, 1.21 percent zinc, and 6.1 ppm silver; the remaining contained from 0.01 to 0.93 percent lead, 0.04 to 2.81 percent zinc, and 0.3 to 4.0 ppm silver. A high grade chip sample with sulfides contained 35.2 percent lead, 5.03 percent zinc, 0.09 percent copper, and 3.2 oz/ton silver. A random chip of mineralized dolomite contained 0.03 percent lead, 0.48 percent zinc, 0.05 percent copper, and 1.2 ppm silver.

CONCLUSIONS: Resource estimates were not made because the remaining ore bodies are of limited size and low grade, and can be considered mined out. Other veins, pods, and lenses are too localized and discontinuous to calculate a resource.

Further exploration may reveal additional resources at this property. However, the deposit does not extend into the study area. Exploration to the south may reveal similar deposits in the Saturday Mountain Formation west of the Badger Creek thrust fault, but no known prospects now exist between Badger Creek and Sunny Bar Canyon.

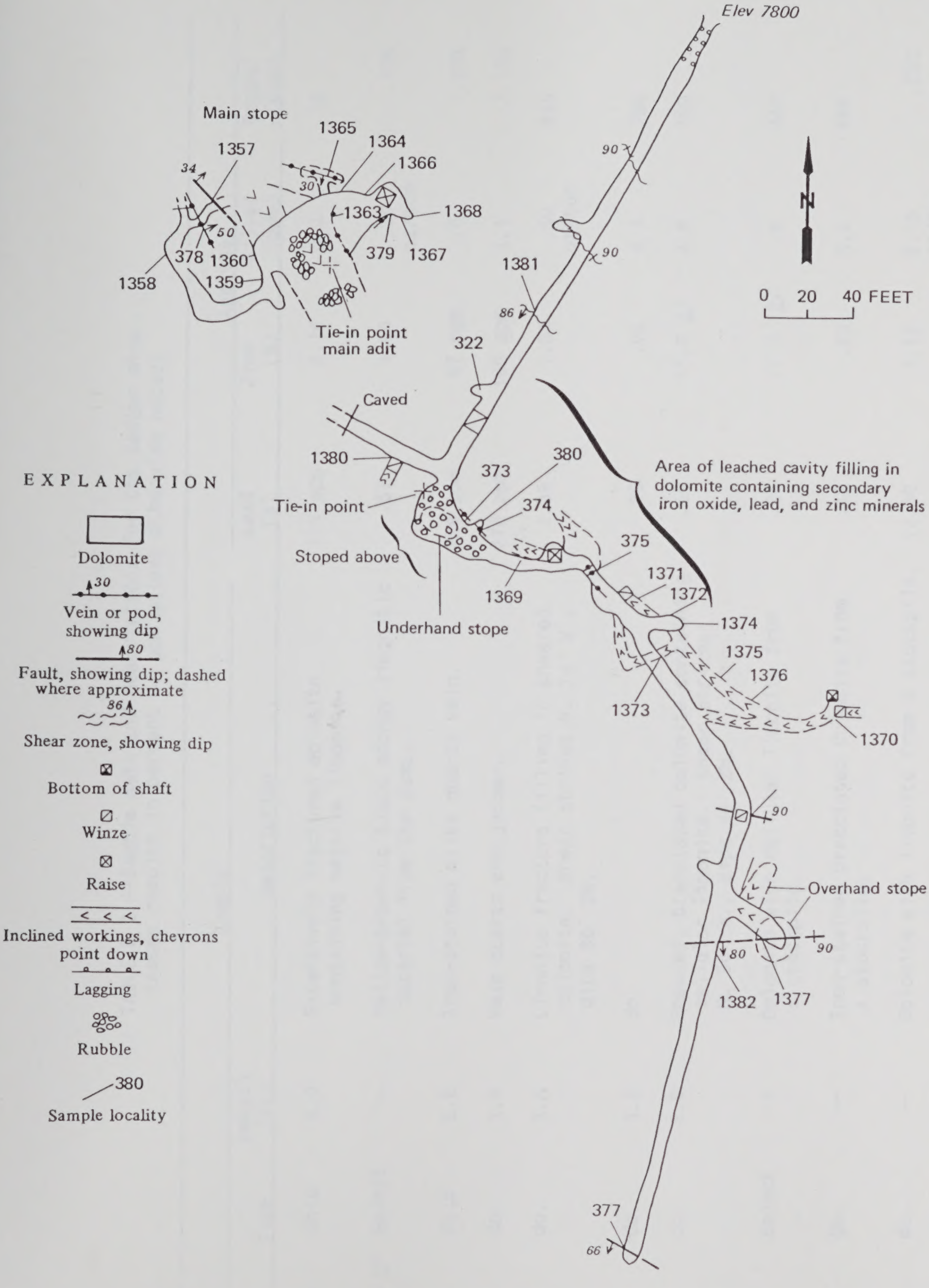

Elev 7800
Main stope
1365
1364
1357
1366
34
30
1363
1368
50
378
1360
379
1367
1358
1359
Tie-in point main adit
90
90
1381
86
0 20 40 FEET
322
Caved
1380
380
373
374
Tie-in point
Area of leached cavity filling in dolomite containing secondary iron oxide, lead, and zinc minerals
375
Stoped above
1369
1371
1372
Underhand stope
1374
1375
1376
1373
1370
90
Overhand stope
90
80
1382
1377
377
66
EXPLANATION
Dolomite
30
Vein or pod, showing dip
80
Fault, showing dip; dashed where approximate
86
Shear zone, showing dip
Bottom of shaft
Winze
Raise
Inclined workings, chevrons point down
Lagging
Rubble
380
Sample locality

FIGURE B-3.– Underground map, adit at elevation 7800 ft, Badger mine

TABLE B-2.--Sample data and descriptions for the Badger mine
(Assay results in percent or ppm unless otherwise noted)

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Zinc (%)	Silver (ppm)	Copper (ppm)
322	Chip	6.0	Extensively fractured dolomite containing massive limonite.	174 ppm	0.16	0.9	18
323 1/	Select	--	Yellow-brown to black spongy limonitic material from the dump.	.57	1.86	.21 oz/ton	.10%
324	Chip	2.0	Iron-stained milky quartz vein.	128 ppm	67 ppm	.6	.28%
325	do.	1.5	Vein quartz and jasper.	270 ppm	160 ppm	1.1	1.15%
326	do.	3.5	Limonite fracture filling in sheared dolomite. Shear strikes N. 74° W., dips 86° SW.	1.39	1.04	.50 oz/ton	295
327	do.	1.5	do.	.29	.92	4.3	780
328	do.	2.0	Sheared, brecciated dolomite containing cellular limonite. Shear strikes N. 50° W., dips 45° SW.	.35	>1.0 2/	4.8	150
329	Select	--	Dolomite with cellular limonite from a stockpile.	.25	>1.0 2/	.8	340
330	do.	--	Iron-stained brecciated dolomite from a stockpile.	.42	.68	3.4	285
331	do.	--	Dolomite with limonite from a stockpile.	12.80	1.63	2.16 oz/ton	.23%

TABLE B-2.--Sample data and descriptions for the Badger mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Zinc (%)	Silver (ppm)	Copper (ppm)
332	Chip	2.0	Sheared, brecciated dolomite with limonite. Shear strikes N. 50° W., dips 5° NE.	0.68	0.90	0.38 oz/ton	250
333	do.	3.0	Shear zone in brecciated dolomite containing cellular limonite.	.72	1.95	2.1	670
334	do.	3.0	do.	.35	2.39	1.9	413
335	Select	--	Sheared brecciated dolomite containing cellular limonite from dump.	.28	.95	1.8	950
336	Chip	5.0	A 4.0-ft-wide granitic dike and iron-stained earthy chill zone in quartzite. The vertical dike strikes N. 36° E.	18 ppm	136 ppm	.1	38
373	do.	1.5	Cellular and boxwork limonite in fractured dolomite.	.70	1.94	3.3	.29%
374	do.	2.0	Small pod of limonite with submetallic clusters.	2.92	1.21	.18 oz/ton	.45%
375	do.	4.0	Zone of limonite in dolomite.	.85	1.44	3.9	373
376	do.	3.0	Vertical shear zone striking N. 85° W. in fractured dolomite. Limonite in fractures.	70 ppm	71 ppm	.4	39
377	do.	1.0	Breccia zone in dolomite. Zone strikes N. 63° W., dips 66° SW.	50 ppm	107 ppm	.5	16
378	do.	3.0	A small pod of limonite.	.34	2.09	.3	640

TABLE B-2.--Sample data and descriptions for the Badger mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Zinc (%)	Silver (ppm)	Copper (ppm)
379	Chip	3.0	A banded limonite zone in dolomite.	0.38	1.94	2.4	0.14%
380	Random chip	26.0	Weakly silicified dolomite with limonite along fractures, joints, and bedding.	300 ppm	.48	1.2	530
381	Chip	3.0	Fracture and breccia zone with limonite in dolomite.	62 ppm	.13	.2	26
382	do.	3.0	Limonite coated fractures in dolomite.	50 ppm	840 ppm	.6	31
1357	do.	0.8	Siliceous boxworks and limonite in fractured dolomite.	.84	2.81	3.2	580
1358	do.	3.0	Limonite filled fractures in dolomite.	270 ppm	410 ppm	.5	33
1359	do.	2.7	do.	149 ppm	830 ppm	.4	28
1360	do.	1.6	Siliceous boxworks and limonite filled fractures in dolomite.	.30	2.64	1.1	450
1361	do.	3.5	Banded limonite zone in dolomite.	200 ppm	.14	.4	70
1362	do.	2.0	Limonite pod with siliceous boxwork and stringers of galena.	35.20	5.03	3.2 oz/ton	850
1363	do.	1.7	Lens of limonite with siliceous stringers; striking N. 60° W., dipping 80° NE.	.60	2.51	1.0	710

TABLE B-2.--Sample data and descriptions for the Badger mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Zinc (%)	Silver (ppm)	Copper (ppm)
1364	Chip	2.8	Lens of limonite with siliceous stringers and disseminated galena; striking N. 60° E., dipping 30° SE.	0.82	1.83	1.1	650
1365	do.	1.0	Limonite pod containing galena and siliceous stringers; striking N. 80° W., dipping 50° NE.	.55	2.22	1.8	530
1366	do.	2.8	Limonite lens with boxworks, galena, and sphalerite.	.93	1.91	2.7	510
1367	do.	3.3	Massive jasper and limonite containing galena and sphalerite.	.59	1.38	4.0	.12%
1368 3/	do.	1.0	Fracture filling limonite and jasper in dolomite.	810 ppm	1.67	1.6	.30%
1369	do.	3.0	Limonite fracture-filling in dolomite.	197 ppm	.45	.5	30
1370	do.	2.8	Siliceous limonite lens.	.14	.45	2.1	500
1371	do.	2.0	do.	.76	2.55	3.3	280
1372 3/	do.	2.9	do.	1.43	2.52	.37 oz/ton	500
1373 3/	do.	2.6	Limonite pod with jasper stringers.	.73	1.63	.23 oz/ton	620
1374	do.	3.2	do.	3.41	1.46	.39 oz/ton	310

TABLE B-2.--Sample data and descriptions for the Badger mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Zinc (%)	Silver (ppm)	Copper (ppm)
1375 4/	Chip	2.2	Limonite pod with jasper stringers.	0.96	1.38	0.33 oz/ton	400
1376 5/	do.	1.3	do.	.18	.46	1.0	540
1377	do.	1.4	Iron-stained shear and breccia zone in dolomite.	95 ppm	100 ppm	.4	88
1378	do.	1.3	Fractured malachite-stained dolomite.	.10	148 ppm	.22 oz/ton	.17%
1379	do.	5.0	Limonite filled fractures in dolomite.	88 ppm	.47	.6	35
1380 5/	do.	1.0	do.	243 ppm	2.36	.6	25
1381 5/	do.	1.7	Iron-stained fractured brecciated dolomite.	24 ppm	110 ppm	.3	20
1382	do.	1.5	do.	126 ppm	87 ppm	1.2	122

1/ Also contains 65 ppb gold
2/ Sample not analyzed for ore grade
3/ Also contains 5 ppb gold
4/ Also contains 15 ppb gold
5/ Also contains 10 ppb gold

NAME: Johnson prospect

AKA: B and N claims

OWNER: Richard E. Nichols and Frank Byrd, Idaho Falls, ID.

MAP NO.: Plate 1, no. 58

LOCATION: Center sec. 29, T. 8 N., R. 29 E., Butte County, ID.

ACCESS: From Howe, ID, about 13 miles north on the Pahsimeroi (Little Lost River Valley) road to the North Creek road, then northeastward for 6 miles to a junction, then 1/2 mile northwestward to the lower Johnson area. The upper Johnson area can be reached by traveling cross-country 1/4 mile northwest of the lower area.

HISTORY: Umpleby (1917, p. 117) referred to the upper Johnson area as the Johnson prospect. Anderson (1948, p. 14) and Ross (1961, p. 257) have also referred to the upper area. In 1952, the Luscomb Mining Company diamond drilled about 5,000 ft at the lower Johnson area (McDowell, 1954, p.109). Some of the core still remains. The president of the company was Ross M. Johnson. Assessment work continued on the claims through the mid 1970's. In 1984, the area was claimed as part of the B and N group.

GEOLOGY: The country rock is principally gray dolomite of the Saturday Mountain and the Jefferson Formations. A band of white quartzite 10 to 40 ft wide is intercalated with the dolomite at the upper Johnson area. It is probably part of the Kinnikinic Quartzite (Beutner, 1968, pl. 1). Another layer of quartzite was observed underground at the upper Johnson area but was insufficiently exposed to map. The dolomite is intensely fractured and has light to moderate iron stains. Shears and faults cut the dolomite in a northeast trend with a northwest dip. Shears consist of intensely fractured dolomite with light to heavy iron stains. Mineralized zones appear to be localized within the shears and consist of bleb and disseminated galena and sphalerite. The property is about 1/2 mile west of the Black Canyon Thrust Fault in the lower plate.

WORKINGS: Location of the workings is shown on figure B-4 and figure B-5. The upper Johnson area consists of a 60 ft deep inclined shaft (fig. B-6), 350 ft adit (fig. B-6), 35 ft adit, 4 adits 5-10 ft long, 4 pits, and 1 trench. The lower Johnson area consists of one 135 ft adit.

SAMPLE RESULTS: Twenty-seven chip, 2 random chip, and 5 select samples were taken. Sample locations are shown on figures B-4 through B-6, and analyses are listed in table B-3. All of the samples contained small amounts of silver with the highest at 1.52 oz/ton. Six chip samples contained between 1.49% and 15.8% zinc; 4 select samples contained 1.38 to 14.3% zinc; and one random chip had 17.7% zinc.

Five chip samples had lead assays in the range of 1.29 to 28.4%. Four select samples ranged from 1.55 to 39% lead with one select assaying 60.3%. One random chip assayed 35.5% lead.

RESOURCE ESTIMATE: Mineralized zones at the upper Johnson area were thin and spotty and did not appear to be continuous, therefore, no resource estimate was done.

CONCLUSIONS: Zinc and lead assays are very high but occur in discontinuous veinlets and pockets. Assays here do represent a minable grade if the mineralized structures become more continuous and widen out. Exploration is needed to delineate structures at depth and determine the extent of mineralized zones.

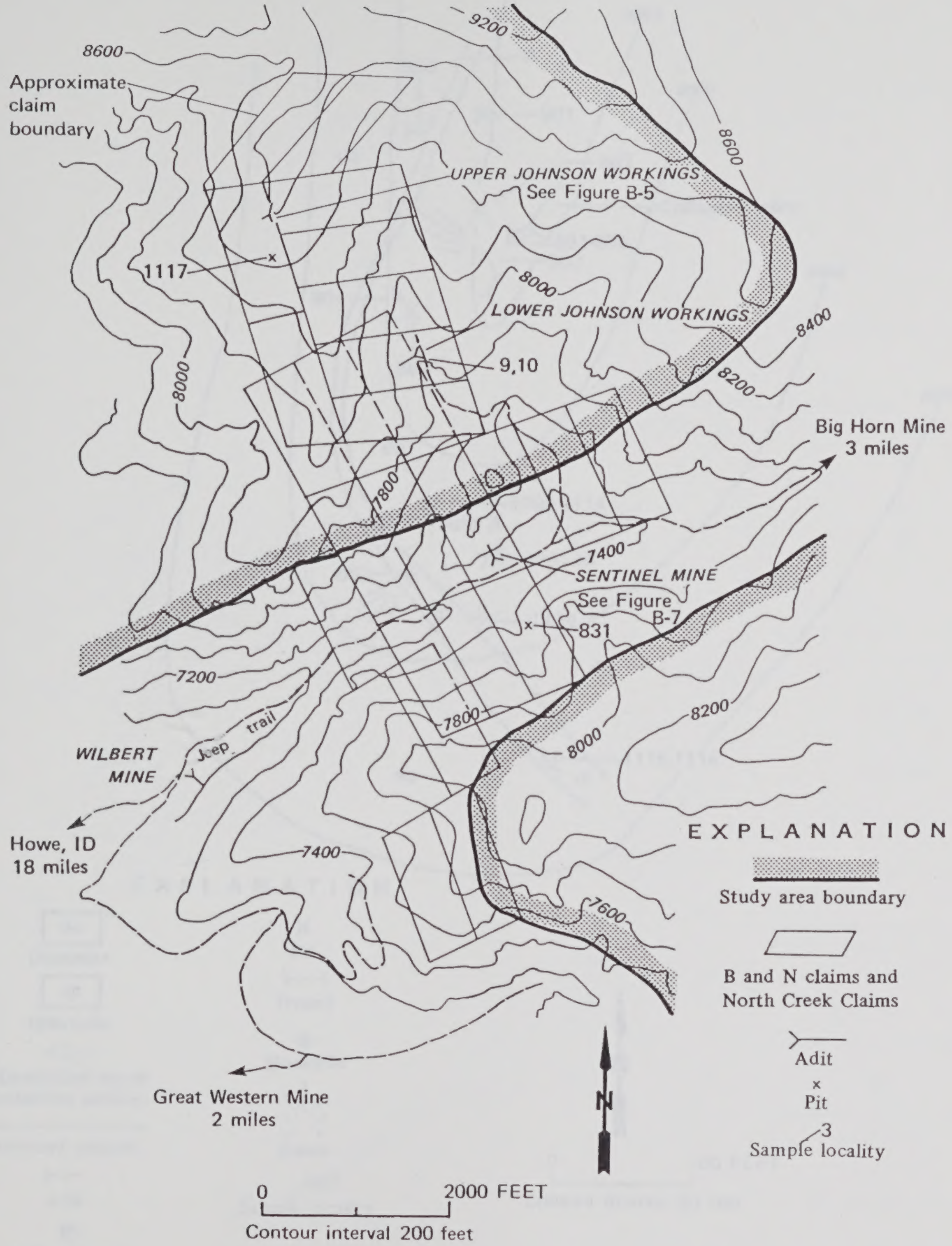

9200
8600
Approximate claim boundary
8600
UPPER JOHNSON WORKINGS
See Figure B-5
1117
8000
LOWER JOHNSON WORKINGS
8400
8000
9,10
8200
Big Horn Mine
3 miles
7800
7400
SENTINEL MINE
See Figure B-7
831
7200
8200
Jeep trail
WILBERT MINE
7800
8000
Howe, ID
18 miles
7400
7600
Great Western Mine
2 miles
N
0
2000 FEET
Contour interval 200 feet
EXPLANATION
Study area boundary
B and N claims and North Creek Claims
Adit
Pit
3
Sample locality

FIGURE B-4.– Surface map, Johnson prospect and Sentinel mine

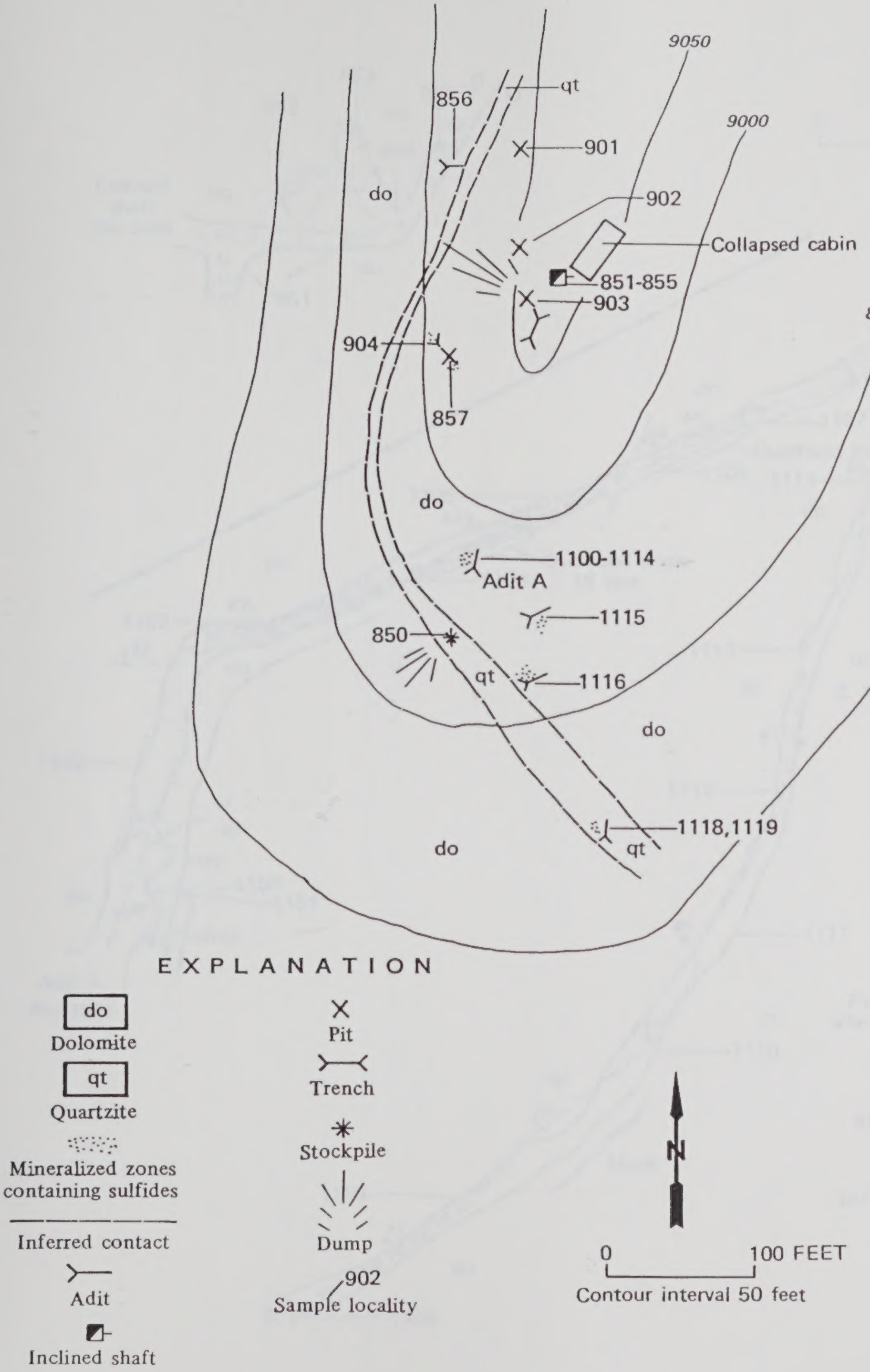

9050
9000
8950
8900
qt
856
901
do
902
Collapsed cabin
851-855
903
904
857
do
1100-1114
Adit A
1115
850
qt
1116
do
1118,1119
qt
do
EXPLANATION
do
Dolomite
qt
Quartzite
Mineralized zones containing sulfides
Inferred contact
Adit
Inclined shaft
Pit
Trench
Stockpile
Dump
902
Sample locality
N
0
100 FEET
Contour interval 50 feet

FIGURE B-5.– Surface map, Johnson prospect, upper workings

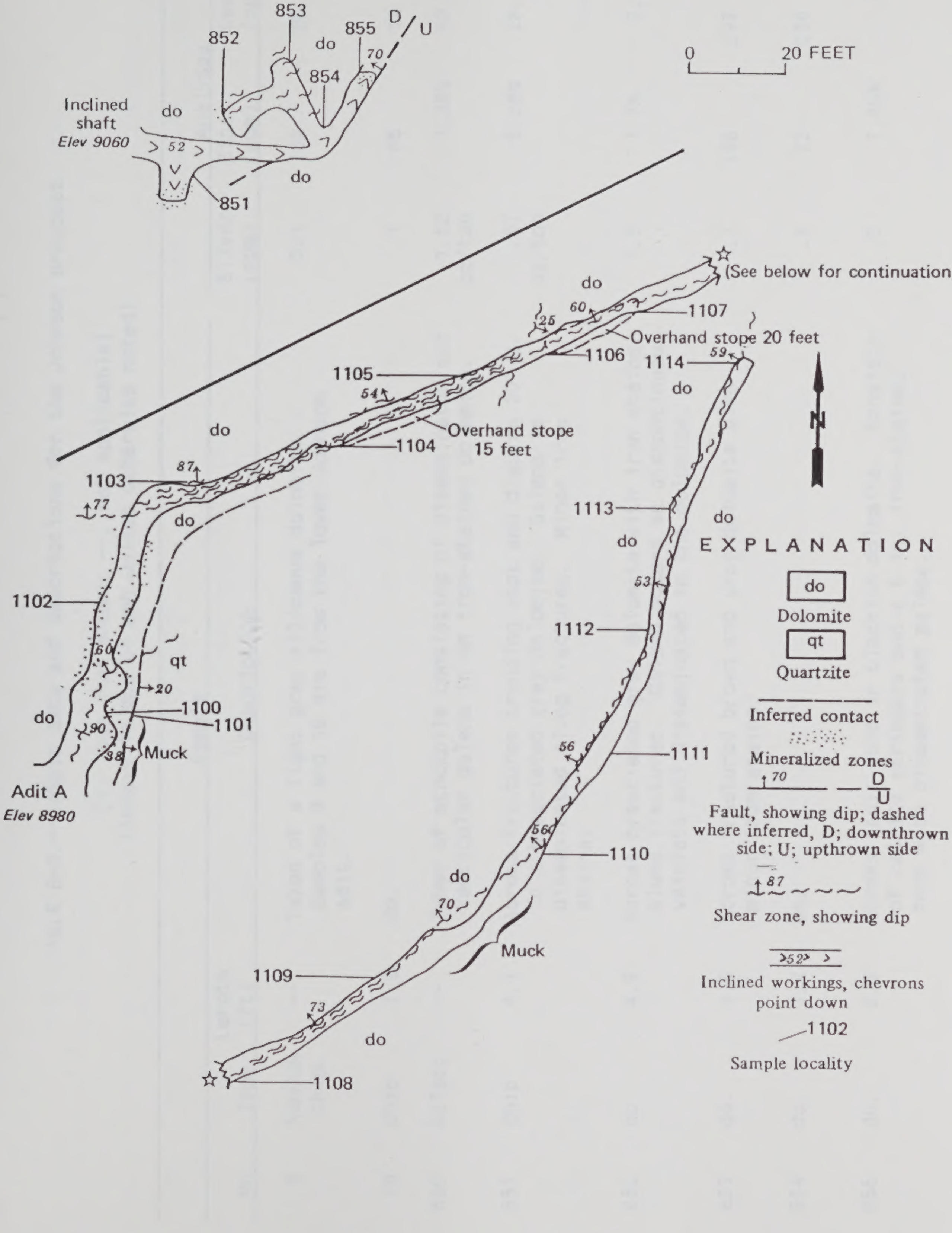

853
852
855
D
U
do
70
854
0
20 FEET
Inclined shaft
Elev 9060
52
851
☆
(See below for continuation)
60
25
1107
Overhand stope 20 feet
1106
1114
59
1105
54
Overhand stope 15 feet
1104
87
1103
77
1113
1102
53
1112
qt
60
20
1100
1101
90
38
Muck
Adit A
Elev 8980
56
1111
56
1110
70
1109
73
1108
N
EXPLANATION
do
Dolomite
qt
Quartzite
Inferred contact
Mineralized zones
Fault, showing dip; dashed where inferred, D; downthrown side; U; upthrown side
87
Shear zone, showing dip
>52> >
Inclined workings, chevrons point down
1102
Sample locality

FIGURE B-6.– Underground map, adit A and inclined shaft, Johnson prospect, upper workings

TABLE B-3.--Sample data and descriptions for the Johnson prospect

[<, less than shown; --, not applicable]
{Assays in ppm or ppb unless otherwise noted}

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
9	Random chip	--	Taken of a light gray siliceous dolomite. Samples 9 and 10 are from the lower Johnson adit.	0.1	32	28
10	Chip	7.9	do.	.1	66	14
850	Select	--	Taken of stockpile consisting of disseminated and lenticular galena in an iron-stained dolomite.	1.52 oz/ton	1.38%	60.30%
851	Chip	4.1	Across fractures trending east and dipping 30° S. in a brecciated gray dolomite. Galena is disseminated along fractures. Minor iron stains.	.57 oz/ton	5.28%	28.40%
852	do.	4.9	Across brecciated gray dolomite with iron stains along fractures. Galena occurs as discontinuous veinlets and disseminated in the dolomite.	1.6	1.7%	2.32%
853	do.	4.6	Across fractured brown and gray dolomite with minor iron stains.	.1	198	297
854	do.	3.8	do.	.1	72	226
855	do.	2.9	Across fault zone in blackish dolomite. Consists of calcite stringers and a 6 in. iron-stained zone with disseminated galena.	.5	1.49%	.80%

TABLE B-3.--Sample data and descriptions for the Johnson prospect--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
856	Chip	3.1	Across fractured gray dolomite with minor iron stains.	0.1	148	106
857	Random chip	--	Taken in a siliceous dolomite with a trend of N. 40° W., dipping 15 - 25° SW. Galena occurs as stringers within the dolomite.	.36 oz/ton	17.7%	35.50%
901	Chip	3.0	Across fractured iron-stained siliceous dolomite.	.1	112	92
902	Select	--	Taken of brecciated dolomite with vugs filled with limonite. Abundant iron stains.	.1	14.30%	1.55%
903	do.	--	Taken of brecciated dolomite with iron staining. Galena is disseminated throughout dolomite.	1.02 oz/ton	6.37%	33.10%
*904	do.	--	Taken of a siliceous iron-stained dolomite with brecciated zones of disseminated galena.	.61 oz/ton	6.85%	39%
1100	Chip	5.0	Across fractured dolomite with iron stains. Mineralized zones consist of lenses of galena and sphalerite.	.6	.59%	.30%
1101	do.	1.0	Across fractured white quartzite with iron stains. Mineralized zones contain abundant galena and sphalerite in a brecciated quartzite.	.32 oz/ton	15.80%	14.40%

TABLE B-3.--Sample data and descriptions for the Johnson prospect--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
1102	Chip	5.5	Across fractured gray dolomite with iron stains. Galena occurs in a lens within the dolomite.	1.4	0.39%	2.10%
1103	do.	4.5	Across brecciated zone between two shears. Consists of a dolomite and quartzite mix with trace iron stains and disseminated galena.	.9	.36%	.95%
1104	do.	2.5	Across brecciated zone between two shears. Consists of dolomite and quartzite intermixed with a trace of iron stains.	.3	600	500
1105	do.	1.5	do.	.1	.13%	425
1106	do.	3.0	do.	.1	700	.27%
1107	do.	2.5	Across brecciated dolomite between two shears. Consists of fractured dolomite with iron stains.	.1	460	.12%
1108	do.	2.5	do.	.1	395	215
1109	do.	3.0	Across fractured shear zone consisting of gray dolomite with calcite stringers. Minor iron stains.	.1	72	26
1110	do.	2.5	do.	.1	31	11

TABLE B-3.--Sample data and descriptions for the Johnson prospect--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
1111	Chip	2.0	Across brecciated gray dolomite with minor iron stains. Calcite stringers occur throughout the dolomite.	0.1	14	2
1112	do.	2.0	Across fractured shear zone consisting of iron-stained gray dolomite. Calcite stringers occur throughout.	.1	27	10
1113	do.	2.0	do.	.1	212	165
1114	do.	2.0	do.	.1	96	91
1115	do.	4.2	Across fractured iron-stained gray dolomite. Consists of a brecciated dolomite with disseminated galena.	.1	3.28%	.14%
1116	do.	4.7	Across fractured intermixed white quartzite and gray dolomite. Minor disseminated galena.	.1	.30%	.82%
1117	Select	--	Taken of white quartzite. Consists of disseminated galena in an iron-stained brecciated quartzite with some gray dolomite mixed in. Sample is from a pit below the main workings of the upper Johnson mine area.	3.0	335	4.80%
1118	Chip	4.5	Across white quartzite layer in dolomite. The unit is fractured and brecciated with iron stains.	.4	.37%	.36%

TABLE B-3.--Sample data and descriptions for the Johnson prospect--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
1119	Chip	5.6	Across brecciated fractured gray dolomite. Sample taken from upper quartzite contact of sample 1118. Unit is iron-stained with a 1 in. zone of disseminated galena.	0.1	7.50%	1.29%

---

* Sample also includes 5 ppb gold.

NAME: Sentinel mine (outside)

AKA: Lindy; North Creek claims

OWNER: Richard E. Nichols and Frank Byrd, Idaho Falls, ID

MAP NO.: Plate 1, No. 59

LOCATION: NE 1/4 sec. 32, T. 8 N., R. 29 E., Butte County, ID.

ACCESS: From Howe, ID, about 13 miles north on the Pahsimeroi (Little Lost River Valley) road to the North Creek road, then northeastward for 6 miles to the mine.

HISTORY: First recorded information on the mine was from county courthouse records. In 1946, the mine was claimed by Fletcher Wheaton. Several authors have written about the mine since 1946, including Anderson (1948, p. 14, 16) and Ross (1961, p. 250-251). The property was incorporated into the North Creek claim group in 1984.

USBM production records show that between 1947 and 1949, 330 tons of ore were produced. Eighty-eight ounces of silver, 184 pounds of copper, 58,045 pounds of lead, and 61,827 pounds of zinc were recovered.

GEOLOGY: The country rock is principally gray dolomite from the Jefferson Formation in contact with Kinnikinic Quartzite (Beutner, 1968, pl. 1). The dolomite is intensely fractured and brecciated with light to moderate iron stains. Shears and faults cut the dolomite in all directions. Shears consist of gouge and brecciated dolomite with locally heavy iron stains. Structurally, the dolomite occurs in a 35° SE plunging anticline striking N. 37° W. with numerous east-west faults. Mineralized areas appear to be in replacement zones and occur in heavily sheared and faulted dolomite. The zones appear to be structurally controlled. Ore minerals include blebs, lenses, and disseminated galena and sphalerite. Ross (1961, p. 250) noted that cerussite, smithsonite, and wulfenite also occur. Anderson (1948, p. 13) noted the presence of massicot and minium (lead oxides) and wulfenite. The property is about 1/2 mi west of the Black Canyon thrust fault and is in the lower plate.

WORKINGS: Location of the workings are shown on figure B-4 and figure B-7. The Sentinel mine consists of a 190 ft adit (fig. B-8) and a 70 ft adit (fig. B-9) which are connected by an ore chute. There is also one shallow pit.

SAMPLE RESULTS: Fifty-one chip, 3 select, and 2 grab samples were taken. Sample locations are shown on figures B-4 and B-7 through B-9, and analyses are listed in table B-4. Twenty-four chip samples contained between 1.34 and 22.90% zinc; 2 select samples contained 14.10% and 17.40% zinc; and 2 grab samples had 2.77% and 2.86% zinc. Sixteen chip samples had lead assays in the range of 1.00% to 19.40%.

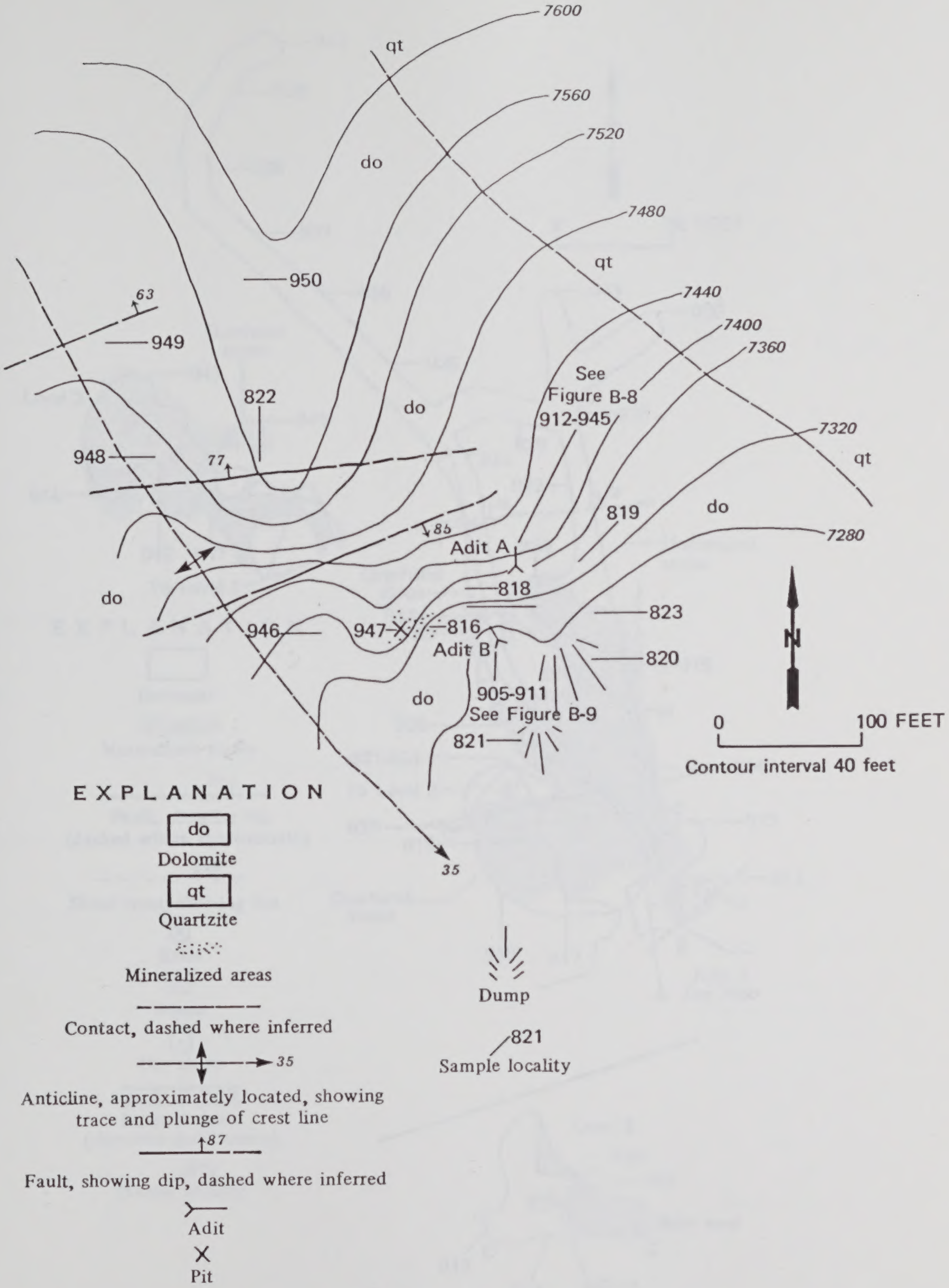

7600
7560
7520
7480
7440
7400
7360
7320
7280
qt
do
950
949
63
822
948
77
See Figure B-8
912-945
819
85
Adit A
818
823
946
947
816
Adit B
820
905-911
See Figure B-9
821
35
0
100 FEET
Contour interval 40 feet
N
EXPLANATION
do
Dolomite
qt
Quartzite
Mineralized areas
Contact, dashed where inferred
35
Anticline, approximately located, showing trace and plunge of crest line
87
Fault, showing dip, dashed where inferred
Adit
Pit
Dump
821
Sample locality

FIGURE B-7.— Surface map, Sentinel mine

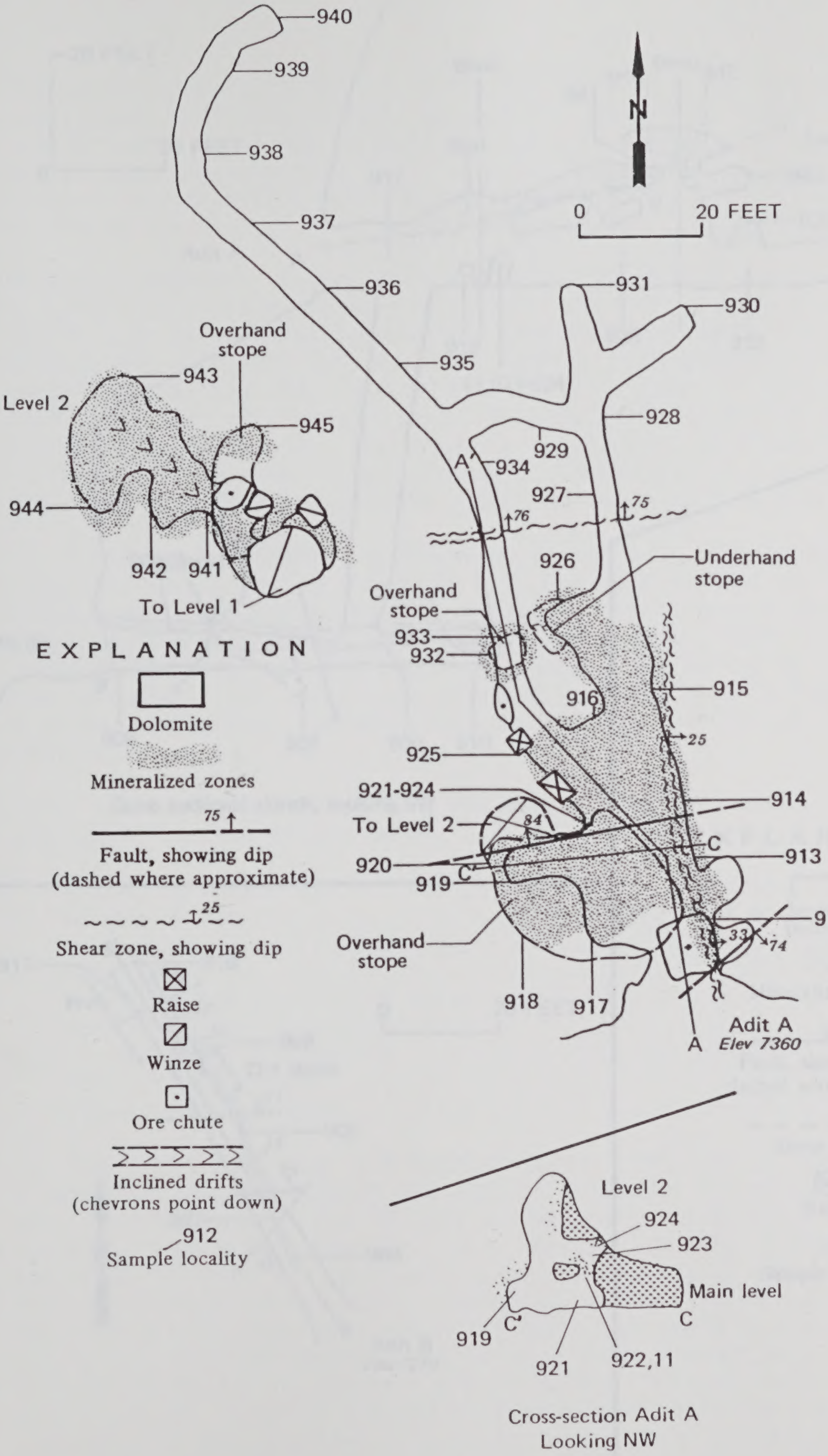

940
939
938
937
936
935
N
0
20 FEET
931
930
928
929
927
934
A'
75
76
926
Underhand stope
Overhand stope
943
Level 2
945
944
942
941
To Level 1
933
932
916
915
25
925
921-924
914
To Level 2
84
C
913
920
C'
919
912
33
74
Overhand stope
918
917
Adit A
A
Elev 7360
EXPLANATION
Dolomite
Mineralized zones
Fault, showing dip (dashed where approximate)
Shear zone, showing dip
Raise
Winze
Ore chute
Inclined drifts (chevrons point down)
912
Sample locality
Level 2
924
923
Main level
C
C'
919
921
922,11
Cross-section Adit A
Looking NW

FIGURE B-8.– Underground map, adit A, Sentinel mine

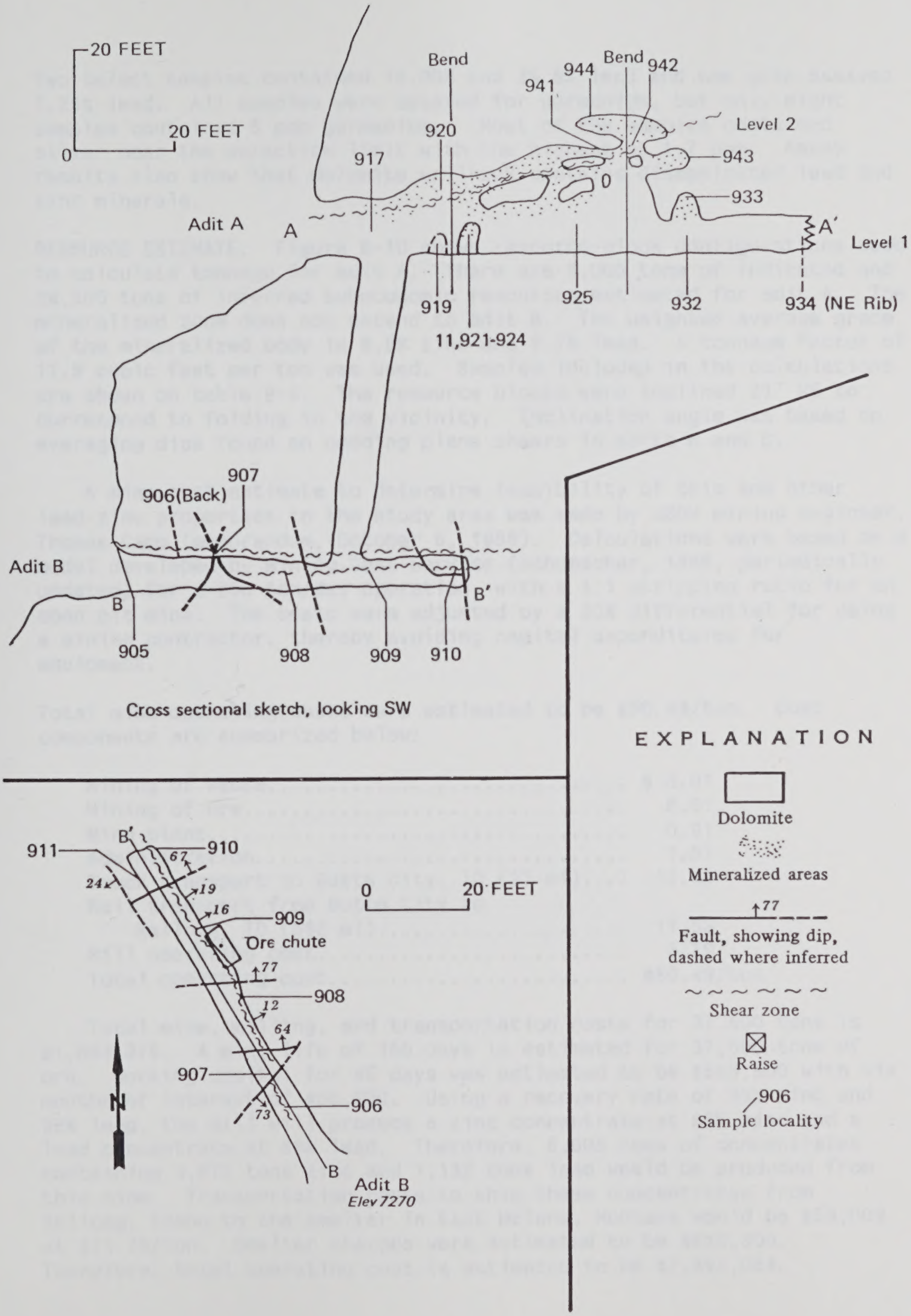

20 FEET
0
20 FEET
Bend
Bend
941
944
942
920
917
Level 2
943
933
0
0
Adit A
A
A′
Level 1
919
925
932
934 (NE Rib)
11,921-924
907
906(Back)
Adit B
B
B′
905
908
909
910
Cross sectional sketch, looking SW
911
910
67
24
19
16
0
20 FEET
909
Ore chute
77
908
12
64
907
906
73
N
B
Adit B
Elev 7270
EXPLANATION
Dolomite
Mineralized areas
77
Fault, showing dip, dashed where inferred
Shear zone
Raise
906
Sample locality

FIGURE B-9.– Underground map, adit B, Sentinel mine

Two select samples contained 16.00% and 35.5% lead and one grab assayed 1.25% lead. All samples were assayed for germanium, but only eight samples contained 5 ppm germanium. Most of the samples contained silver near the detection limit with the highest at 1.7 ppm. Assay results also show that dolomite wallrock contains disseminated lead and zinc minerals.

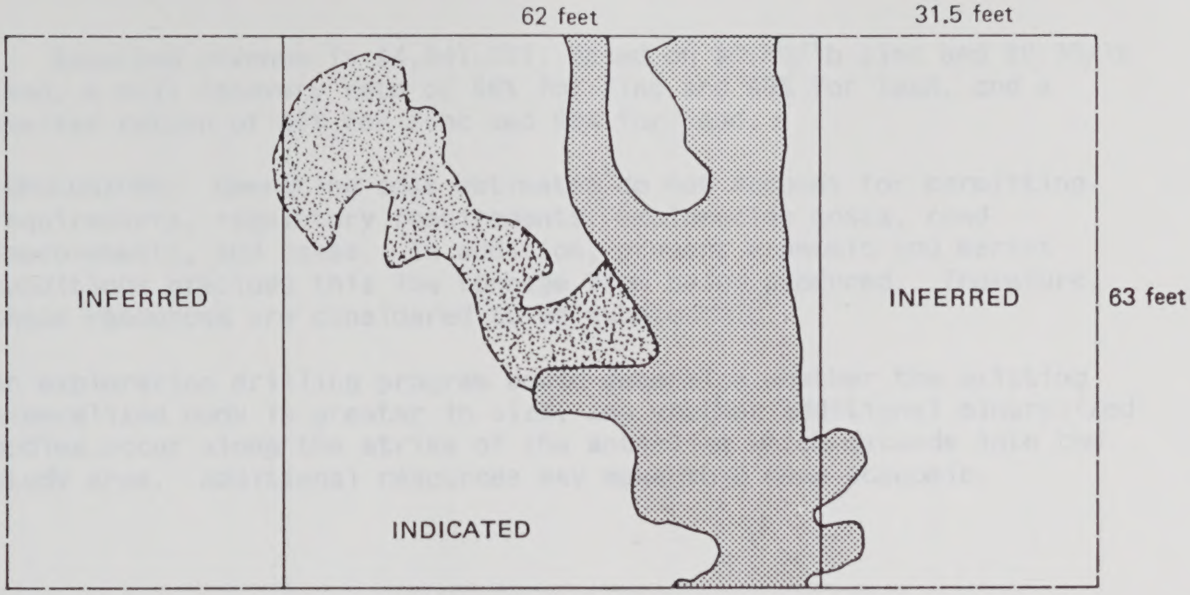
RESOURCE ESTIMATE: Figure B-10 shows resource-block configurations used to calculate tonnage for adit A. There are 8,000 tons of indicated and 29,500 tons of inferred subeconomic resources estimated for adit A. The mineralized zone does not extend to adit B. The weighted average grade of the mineralized body is 8.5% zinc and 2.7% lead. A tonnage factor of 11.5 cubic feet per ton was used. Samples included in the calculations are shown on table B-4. The resource blocks were inclined 21° NE to correspond to folding in the vicinity. Inclination angle was based on averaging dips found on bedding plane shears in adits A and B.

A mine cost estimate to determine feasibility of this and other lead-zinc properties in the study area was made by USBM mining engineer, Thomas Camm (memorandum, October 6, 1988). Calculations were based on a model developed by Mining Cost Service (Schumacher, 1988, periodically updated) for a 250 ton/day operation, with a 1:1 stripping ratio for an open pit mine. The costs were adjusted by a 20% differential for using a mining contractor, thereby avoiding capital expenditures for equipment.

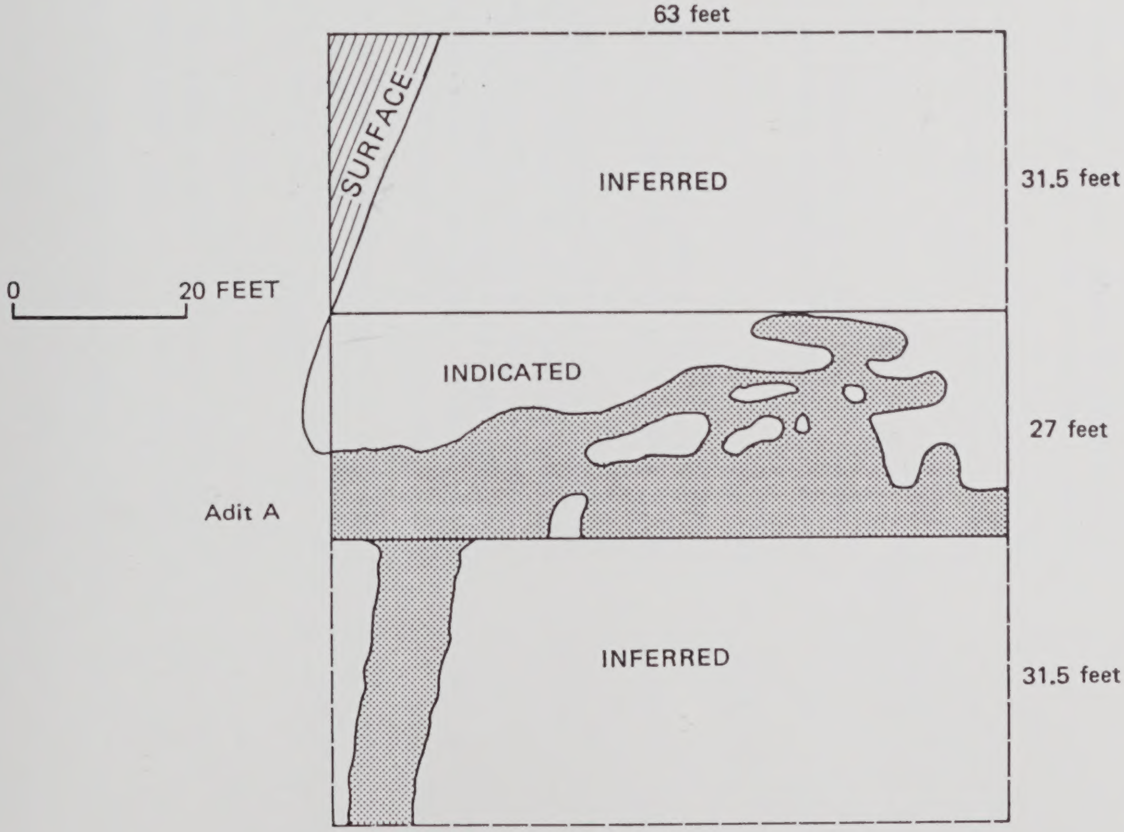
Total mine operating costs were estimated to be $50.49/ton. Cost components are summarized below:

Mining of waste	$ 8.01
Mining of ore	8.01
Mine plant	0.91
Administration	1.81
Truck transport to Butte City, ID (37 mi)	13.43
Rail transport from Butte City to Kellogg, ID (565 mi)	11.53
Mill operating cost	6.79
Total operating cost	$50.49/ton

Total mine, milling, and transportation costs for 37,500 tons is $1,893,375. A mine life of 150 days is estimated for 37,500 tons of ore. Working capital for 45 days was estimated to be $568,500 with six months of interest of $56,900. Using a recovery rate of 96% zinc and 90% lead, the mill will produce a zinc concentrate at 87% zinc and a lead concentrate at 88% lead. Therefore, 5,005 tons of concentrates containing 3,872 tons zinc and 1,133 tons lead would be produced from this mine. Transportation costs to ship these concentrates from Kellogg, Idaho to the smelter in East Helena, Montana would be $59,009, at $11.79/ton. Smelter charges were estimated to be $856,800. Therefore, total operating cost is estimated to be $2,866,084.


62 feet
31.5 feet
INFERRED
INFERRED
63 feet
INDICATED

Plan View Adit A


63 feet
SURFACE
INFERRED
31.5 feet
0
20 FEET
INDICATED
27 feet
Adit A
INFERRED
31.5 feet

Longitudinal View Adit A

NOTE: Shading represents mined-out areas

FIGURE B-10.– Indicated and inferred resource blocks for adit A, Sentinel mine

Expected revenue is $4,241,281, based on $0.69/lb zinc and $0.39/lb lead, a mill recovery rate of 96% for zinc and 90% for lead, and a smelter return of 85% for zinc and 93% for lead.

CONCLUSIONS: Operating cost estimates do not account for permitting requirements, regulatory requirements, exploration costs, road improvements, and taxes. In addition, present economic and market conditions preclude this low tonnage from being produced. Therefore, these resources are considered to be subeconomic.

An exploration drilling program would determine whether the existing mineralized body is greater in size, and whether additional mineralized bodies occur along the strike of the anticline which extends into the study area. Additional resources may make this mine economic.

TABLE B-4.--Sample data and descriptions for the Sentinel mine

(<, less than shown; --, not applicable; assays in ppm unless otherwise noted; * sample used in resource calculation)

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
11	Select	--	Taken from high grade zone on a pillar in the main stope area. Consists of band of galena dipping 38° SE, with an undulating width of 1 to 7 in. The galena is fine grained with sphalerite and quartz stringers and is in a brecciated dolomite. The zone is vuggy and iron-stained with trace copper stains.	0.7	14.10%	35.50%
816	Chip	8.0	Across dolomite outcrop consisting of veinlets of limonite. The dolomite is silicified and brecciated.	.2	3.53%	0.60%
817	do.	6.0	do.	.1	850	200
818	do.	5.8	Across brecciated dolomite outcrop with blebs of sphalerite. Heavy iron stains.	.1	.19%	308
819	do.	6.2	do.	.1	370	107
820	Grab	--	Taken from upper adit dump and consists of gray brecciated dolomite with limonite blebs.	.1	2.77%	1.25%
821	do.	--	Taken from lower adit dump and consists of gray brecciated dolomite with limonite blebs.	.1	2.86%	0.40%
822	Chip	3.5	Across brecciated dolomite outcrops. Contains limonite and calcite veinlets.	.1	200	51

TABLE B-4.--Sample data and descriptions for the Sentinel mine--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
823	Chip	6.0	Across brecciated dolomite outcrop. Contains limonite and calcite veinlets.	0.1	430	48
831	Select	--	Taken from trench across valley from main Sentinel mine. Consists of a white quartzite completely iron-stained and vuggy.	.1	930	320
905 1/	Chip	4.1	Taken of sheared siliceous dolomite with veinlets of calcite.	.1	900	0.19%
906 2/	do.	2.0	Across sheared dolomite with high silica content. Contains veinlets of limonite.	.1	0.18%	650
907 1/	do.	.7	do.	.1	0.77%	0.28%
908 3/	do.	3.0	do.	.1	0.26%	520
909 1/	do.	1.2	do.	.1	0.35%	0.15%
910 1/	do.	1.2	do.	.1	990	225
911 3/	do.	1.2	Across shear gouge material; lenticular with a 2-ft length.	.1	0.12%	0.14%
*912 4/	do.	6.0	Across brecciated dolomite with 0.8 ft shear zone consisting of limonite with veinlets of quartz. Upper 4.0 ft of sample, near back, contains blebs of galena disseminated throughout the dolomite.	.1	13.1%	2.27%

TABLE B-4.--Sample data and descriptions for the Sentinel mine--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
*913 4/	Chip	5.3	Across brecciated dolomite with 0.8 ft shear zone consisting of limonite with veinlets of quartz. Upper 4.0 ft of sample, near back, contains blebs of galena disseminated throughout the dolomite.	0.1	9.54%	2.41%
*914 1/	do.	6.0	Across sheared dolomite with light iron staining. Veinlets of calcite with trace blebs of galena.	.1	6.43%	1.59%
*915 1/	do.	8.5	Across iron-stained coarse-grained dolomite with veinlets of calcite. Upper 1 to 2 ft of sample, near the back, contains blebs of galena and stringers of quartz.	.1	22.9%	2.33%
*916 4/	do.	5.5	Across dolomite with stringers of calcite and quartz. Trace iron stains with possible blebs of altered galena along some fractures.	.5	9.77%	1.82%
*917	do.	8.2	Across brecciated dolomite with heavy iron stains. Blebs and stringers of altered galena and sphalerite are disseminated throughout the dolomite.	.1	9.78%	3.54%
*918 2/	do.	7.8	Continuation of sample 917 to top of stope. Same description as 917.	.3	15.3%	2.17%
*919 1/	do.	6.3	Across lightly brecciated dolomite, heavily fractured.	.1	1.34%	0.40%

TABLE B-4.--Sample data and descriptions for the Sentinel mine--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
*920	Chip	8.0	Continuation of sample 919 to top of stope.	0.1	1.91%	0.39%
*921	do.	4.0	First of four samples taken up pillar to top of stope. This sample starts from the floor. It consists of siliceous dolomite with stringers of quartz. Minor iron stains near the quartz.	.1	4.30%	0.19%
*922 1/	do.	3.0	Continuation of sample 921. Consists of a siliceous dolomite with iron stains. Abundant disseminated galena.	.2	7.36%	19.4%
*923	do.	4.0	Continuation of sample 922. Consists of a brecciated dolomite with stringers of quartz and calcite. Iron stains occur along fractures Spotty galena occurs disseminated in the dolomite.	.6	7.09%	3.87%
*924	do.	1.5	Continuation of sample 923. Consists of a brecciated dolomite with stringers of quartz and calcite. Iron stains occur along fractures. A 0.3 to 0.5 in. stringer of galena occurs near the top of the stope.	.5	6.33%	15.40%
*925	do.	12.0	Across sheared dolomite with iron staining along upper 3 ft of sample. Galena occurs in spotty amounts.	.2	6.80%	.17%

TABLE B-4.--Sample data and descriptions for the Sentinel mine--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
*926	Chip	5.0	Across shear zone consisting of brecciated dolomite with abundant iron stains. The shear contains altered dolomite. Veinlets and blebs of sphalerite, galena, and limonite occur in the dolomite.	0.5	11.50%	5.35%
927	do.	5.0	Across siliceous brecciated dolomite with minor iron stains along fractures. Stringers of quartz and calcite cut the dolomite.	.1	.16%	450
928	do.	4.5	Across sheared dolomite with iron stains. Stringers of quartz and calcite cut the dolomite. Possible weathered galena occurs near the top of the sample.	.1	5.52%	.48%
929	do.	3.5	do.	.1	600	115
930	do.	5.0	Across sheared dolomite with stringers of limonite. Dolomite alternates from a gray to almost black color.	.1	440	114
931	do.	6.0	Across sheared dolomite with stringers of quartz and calcite. Trace iron stains along fractures.	.1	1.38%	530
*932	do.	8.0	Across sheared siliceous dolomite with iron stains along fractures. Stringers of calcite cut the dolomite.	.1	.24%	135

TABLE B-4.--Sample data and descriptions for the Sentinel mine--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
*933 1/	Chip	3.5	Taken in small stope above sample 932. Consists of brecciated dolomite with heavy iron stains. Abundant galena is disseminated in layer near the top of the stope.	0.1	6.34%	0.51%
934 1/	do.	5.0	Across sheared dolomite with heavy iron stains. Stringers of calcite cut the dolomite.	.1	780	76
935	do.	5.0	Across sheared dolomite with stringers of calcite and quartz. Dolomite alternates between a light gray and black color. Shear consists of brecciated dolomite with iron stains.	.1	197	33
936	do.	6.0	Across sheared dolomite with stringers of calcite and limonite.	.1	130	25
937	do.	5.5	do.	.1	72	14
938	do.	6.0	do.	.1	106	19
939	do.	6.5	do.	.1	116	40
940	do.	6.5	Across sheared dolomite with stringers of calcite, quartz and limonite.	.1	50	13
*941	do.	4.0	Across brecciated dolomite with heavy iron stains. Blebs of galena and sphalerite disseminated throughout the dolomite.	1.3	14.90%	9.36%

TABLE B-4.--Sample data and descriptions for the Sentinel mine--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
*942	Chip	4.8	Across brecciated dolomite bordering a shear zone. The shear consists of altered dolomite with heavy iron stains. Shear comprises only a few inches of the sample. The brecciated dolomite consists of minor iron stains with possible blebs of altered sphalerite and galena.	0.1	3.4%	5.35%
*943	do.	3.0	Across brecciated dolomite with shear at the back. Consists of altered dolomite with iron stains. Possible blebs of sphalerite and galena.	1.5	11.80%	1%
*944	do.	7.0	Across back of stope of the second level. Consists of brecciated dolomite with stringers of sphalerite and galena. Shear zone cuts sample but is less than an inch thick. Dolomite is fractured with heavy iron stains near the shear.	.1	4.57%	2.28%
*945	do.	3.0	Across sheared and brecciated dolomite. Consists of altered dolomite with iron stains and stringers of sphalerite and galena.	.7	11%	1.86%
946	do.	6.0	Across sheared dolomite with iron stains along fractures. Dolomite is silicified and is cut by stringers of calcite.	.1	350	85
947	Select	--	Taken at pit of brecciated dolomite with stringer of altered galena. Dolomite is altered.	1.7	17.4%	16%

TABLE B-4.--Sample data and descriptions for the Sentinel mine--Continued

Sample				Analyses		
No.	Type	Length (ft)	Description	Silver (ppm)	Zinc (ppm)	Lead (ppm)
948	Chip	3.0	Taken at an outcrop of bleached dolomite with iron stains along fractures. Calcite coats the fractures also.	0.1	500	390
949	do.	3.0	Taken at an outcrop of bleached dolomite with blebs of limonite.	.1	165	80
950	do.	5.0	Taken at an outcrop of bleached dolomite with iron stains along fractures. Calcite stringers cut the dolomite.	.1	85	52

1/ Also includes 5 ppb gold.
2/ Also includes 10 ppb gold.
3/ Also includes 20 ppb gold.
4/ Also includes 15 ppb gold.

NAME: Wilbert mine (outside)

AKA: Daisy Black mine

OWNER: Gary L. Baker, Holbrook, ID 83243

MAP NO.: Plate 1, No. 61

LOCATION: S 1/2 sec. 32, T.8 N., R.29 E. and NE 1/4 sec. 5, T.7 N., R. 29 E.

ELEVATION: 6,800 ft to 7,600 ft.

ACCESS: From Howe, ID take the Pahsimeroi (Little Lost River Valley) road 13 mi north to the Waymire Ranch/North Creek dirt road; then 6 mi northeast to the Daylight tunnel entrance.

HISTORY: The Daisy Black mine was located at Camp Creek in 1882 by Charles Blackburn, and was patented in 1889 by the Wilbert Mining Company. Six other mining claims and three millsites on Camp Creek were located between 1883 and 1927, and 145 acres were patented by 1928.

Between 1906 and 1911, about 1,500 tons of hand-sorted ore were produced, and sent to Utah for smelting. In 1908, a 100-ton per day gravity mill was built on Camp Creek that operated until destroyed by fire in 1918. In 1922, operations were moved to the Wilbert mine on North Creek where a 1,420-ft-long crosscut, called the Daylight tunnel, was driven under the ore body. In 1924, a 75 ton per day gravity mill was built on North Creek near the portal of the tunnel (Ross, 1933). It operated until 1931 when mining operations ceased. In 1941, mining and milling resumed during World War II, and continued intermittently until 1950. In 1945, a 100 ton per day flotation mill was built at the intersection of North Creek and Camp Creek, 1 1/4 mi from the Daisy Black mill, to treat the old mill tailings.

Between 1906 and 1950, more than 140,000 tons of ore were produced with average grades between 4 and 47% lead and 0.6 to 6 oz/ton silver. Minor amounts of zinc, copper, and gold were also produced. Much of the production after 1941 came from reworking old dumps. Between 1965 and 1968, the Bell Mountain Mining Company produced more than 1,500,000 lb of lead and 14,000 oz of silver from mill tailings.

GEOLOGY: The Wilbert mine is in the Lower Ordovician Summerhouse Formation (Ruppel and others, 1975) at the contact with the Ordovician Kinnikinic Quartzite and 3/4 mi west of the Black Canyon thrust fault (Beutner, 1968, pl. 1).

The area is complexly folded and faulted; sedimentary units are folded, overturned, and thrusted to the northeast, and are offset by transverse faults. Mineralized zones are found in structurally prepared and somewhat altered dolomite and quartzitic dolomite of the Summerhouse Formation near the contact with the Kinnikinic Quartzite. Galena is the main ore mineral; it is argentiferous and in places has been altered to anglesite and cerussite. Minor amounts of zinc, copper, and trace gold are also present. Secondary iron and manganese oxides and calcite are also found associated with the ore. The ore is primarily found as replacement bodies in the dolomitic units. It also occurs as fracture fillings in shear zones, as veins, and as disseminations within the wallrock. The presence of secondary minerals indicates that leaching and oxidation have taken place. Altered silicic and basic dikes have been found at the northern end of the mine. Dike intrusion and mineralization are probably related events. (See Anderson, 1947, p. 368-371).

Ore zones have been traced for about 2,000 ft laterally, and to a depth of about 750 ft. Ore in the upper levels of the mine occurs in northwest-trending shear and fault zones; ore shoots trend N. 20°-80° W., and dip 20-80° NE. or SW. In the middle levels, ore occurs as a vein along a northwest-trending thrust fault that has been folded, and dips about 45° SW. Ore in the lowest levels occurs as replacements in dolomite at the contact between the Summerhouse Formation and the Kinnikinic Quartzite. (See Anderson, 1947, p. 373-374; Ross, 1933, p. 6-9).

WORKINGS: More than 18,000 ft of adits, drifts, cross-cuts, raises, winzes, stopes, and shafts develop the mineralized zone over a horizontal distance of about 2,500 ft and a vertical distance of about 750 ft. Only the surface of the mine was mapped for this study because it is about 3/4 mi outside the study area (fig. B-11). In 1986 and 1987, the entrance to the main underground workings, the Daylight tunnel, contained water about 2 ft deep for about 200 ft; winzes are flooded, and most of the raises and stopes are caved and inaccessible.

SAMPLING: One hundred seven samples were collected from dumps, surface workings, and minor underground workings to determine the nature of the remaining ore (table B-5). These included 44 chip, 45 grab, 15 select, and 3 random chip samples. Five samples were collected from shear zones in the main underground workings (table B-5, no. 1414-1418). Sixteen samples were taken at the Ore House Nos. 7 and 8, which were originally part of the unpatented holdings of the Wilbert Mining Company (fig. B-11).

Twenty chip samples taken by USBM in 1945 of the ore zone at the north end of the main Wilbert workings contained from 0.3 oz/ton to 8.2 oz/ton silver, 0.3 to 32% lead, nil to 1.4% zinc, and trace amounts of gold (Shaffer, 1945).

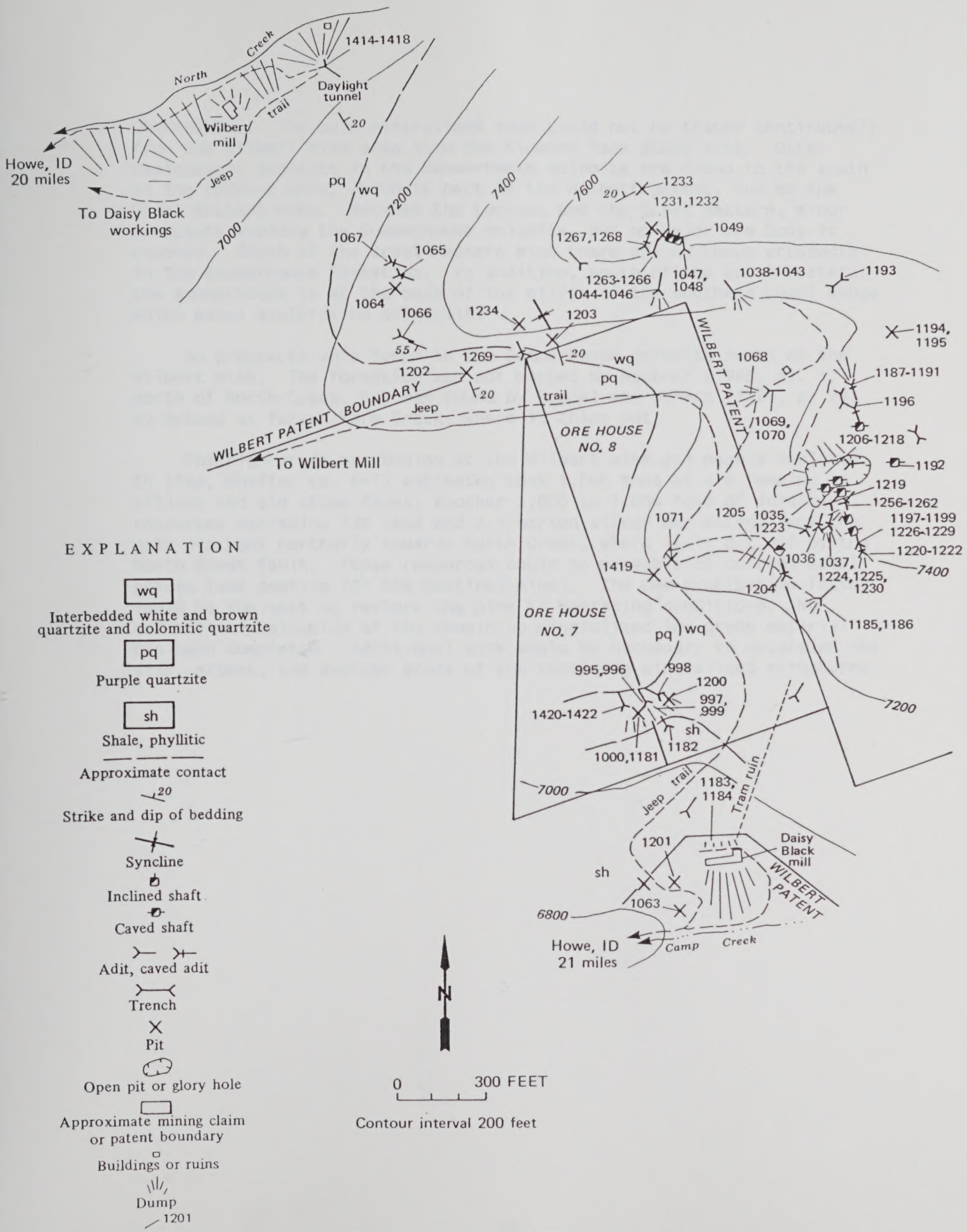

North Creek
1414-1418
Daylight tunnel
Wilbert mill
trail
Jeep
Howe, ID 20 miles
To Daisy Black workings
20
pq
wq
7000
7200
7400
7600
1233
1231,1232
1267,1268
1049
1067
1065
1064
1066
55
1263-1266
1044-1046
1047, 1048
1038-1043
1193
1234
1203
1194, 1195
1269
1202
20
WILBERT PATENT BOUNDARY
Jeep trail
To Wilbert Mill
WILBERT PATENT
1068
1187-1191
1196
1069, 1070
ORE HOUSE NO. 8
1206-1218
1192
1219
1256-1262
1197-1199
1226-1229
1220-1222
1071
1205
1035, 1223
1036
1037, 1224,1225, 1230
1419
1204
1185,1186
ORE HOUSE NO. 7
995,996
998
1200
997, 999
1420-1422
sh
1182
1000,1181
7200
Jeep trail
Tram ruin
1183, 1184
1201
Daisy Black mill
WILBERT PATENT
1063
6800
Howe, ID 21 miles
Camp Creek
N
0
300 FEET
Contour interval 200 feet
EXPLANATION
wq
Interbedded white and brown quartzite and dolomitic quartzite
pq
Purple quartzite
sh
Shale, phyllitic
Approximate contact
20
Strike and dip of bedding
Syncline
Inclined shaft
Caved shaft
Adit, caved adit
Trench
Pit
Open pit or glory hole
Approximate mining claim or patent boundary
Buildings or ruins
Dump
1201
Sample locality

FIGURE B-11.– Surface map, Wilbert mine and Ore House Nos. 7 and 8 prospect

CONCLUSIONS: The main mineralized zone could not be traced continuously from the Wilbert mine area into the Diamond Peak study area. Other replacement deposits in the Summerhouse dolomite are found to the south at the Lookout mine, which is part of the Wilbert patent, and at the Great Western mine. Between the Lookout and the Great Western, minor prospects explore the Summerhouse dolomite, but no major ore body is exposed. South of the Great Western mine there are no known prospects in the Summerhouse Formation. In addition, south of the Great Western, the Summerhouse is at the base of the cliffs of the southern Lemhi Range which makes exploration difficult.

No prospects were found in the Summerhouse dolomite north of the Wilbert mine. The formation was not mapped by Beutner (1968, pl. 1) north of North Creek, but was found by Ruppel and others (1975, p. 28) to extend as far as Warm Creek, where it thins out.

The high-grade ore bodies at the Wilbert mine are nearly depleted. In 1945, Shaffer (p. 6-7) estimated that 1,000 tons of ore remains in pillars and old stope faces; another 3,000 to 7,000 tons of inferred resources averaging 13% lead and 2.1 oz/ton silver may extend from the main ore body northerly towards North Creek, where it is cut off by the North Creek fault. These resources could be mineable at current metal prices (see costing for the Sentinel mine). The one prohibitive factor would be the cost to restore the mine to operating conditions. No definitive evaluation of the remaining mineralized low grade material has been completed. Additional work would be necessary to determine the size, extent, and average grade of the remaining mineralized structures.

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8

[Analyses are reported in percent, oz per ton, or parts per million unless otherwise noted; n/a, not analyzed; >, greater than]

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
995	Chip	4.0	Across fractured white quartzite with iron oxide minerals along fractures. (Ore House No. 7)	0.16	1.0 ppm	340	15
996 1/	do.	6.9	Across fractured quartzite with galena and cerussite stringers. (Ore House No. 7)	2.01	.11	470	18
997	Grab	--	From dump of brown and white quartzite, galena vein material, and leached iron oxides. (Ore House No. 8)	>1.0	.11	350	13
998 2/	Chip	3.5	Across fractured white quartzite with iron oxide minerals along fractures. (Ore House No. 8)	.44	1.8 ppm	223	14
999	Select	--	From dump of white quartzite containing galena, sphalerite, and malachite. (Ore House No. 8)	44.8	3.85	.41%	.24%
1000	Random chip	--	Across fractured white quartzite. (Ore House No. 7)	164 ppm	.3 ppm	34	5
1035	Chip	6.0	Across fractured white quartzite with minor galena, pyrite, and iron and manganese oxides.	1.14	.14	87	48
1036	do.	5.0	do.	.80	.51	430	132

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1037	Chip	5.0	Across fractured white quartzite with minor galena, pyrite, and iron and manganese oxides.	0.58	1.8 ppm	66	20
1038	do.	6.9	Across fractured white and brown quartzite with stringers and disseminated galena.	1.98	2.8 ppm	60	7
1039	do.	7.3	do.	4.28	.20	55	81
1040	Grab	--	From dump of brown dolomitic quartzite and white quartzite with bands of galena and sphalerite, and manganese oxides.	.90	2.6 ppm	392	18
1041	Chip	1.3	Across shear zone in brown quartzite containing stringers and blebs of galena with some gouge.	19.2	.82	.64%	48
1042	Select	--	From dump of white quartzite containing stringers and disseminated galena, blebs of chalcocite, malachite, and azurite.	27.2	6.42	.29%	0.19%

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1043	Select	--	From stockpile of white quartzite with galena, chalcocite, malachite, and azurite.	33.0	4.43	410	0.26%
1044	Grab	--	From dump of white and brown quartzite.	.12	.6 ppm	100	21
1045	Select	--	From stockpile of white quartzite with veinlets and disseminated galena and sphalerite, and malachite and azurite.	21.5	2.86	.28%	3.59%
1046	Chip	4.5	Across contact between fractured brown and white quartzite.	.11	1.7 ppm	61	133
1047	do.	5.0	Across brown, iron-stained quartzite.	520 ppm	.7 ppm	105	40
1048	Grab	--	From dump of brown and white quartzite; the white quartzite contains galena.	.75	2.2 ppm	320	16
1049	Chip	3.5	Across shear zone in brown quartzite with stringers and blebs of galena.	3.51	.29	156	11
1063	Grab	--	Of brown quartzite.	84 ppm	.3 ppm	11	9
1064	do.	--	do.	40 ppm	.1 ppm	69	14
1065	Chip	3.0	Across fractured light gray quartzite.	350 ppm	.4 ppm	85	47

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1066	Chip	4.5	Across brown and white quartzite.	83 ppm	0.1 ppm	20	16
1067	Grab	--	From dump of white and light gray quartzite; the white quartzite contains limonite after pyrite pseudomorphs.	112 ppm	.1 ppm	58	7
1068	do.	--	From dump of white and light gray quartzite.	750 ppm	.1 ppm	900	9
1069	Chip	4.0	Across shear zone in light gray quartzite.	.14	.4 ppm	.10%	7
1070	do.	3.0	do.	98 ppm	.1 ppm	57	8
1071	Grab	--	Of white and light gray quartzite with limonite after pyrite pseudomorphs. (Ore House No. 8)	122 ppm	.1 ppm	66	10
1181	do.	--	Of brown quartzite and phyllite with heavy iron staining. (Ore House No. 7)	377 ppm	.4 ppm	88	36
1182	do.	--	From dump of phyllite and purple quartz. (Ore House No. 8)	32 ppm	.1 ppm	33	15
1183	Select	--	From Daisy Black Mill Site of white quartzite with bands of galena and sphalerite.	14.2	3.24	.50%	195

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1184	Select	--	From Daisy Black Mill Site of white quartzite with bands of galena and sphalerite.	10.2	1.99	0.13%	13
1185	Grab	--	From dump, of white quartzite containing blebs of galena.	2.55	.42	960	18
1186	do.	--	do.	6.39	.82	.16%	57
1187	Chip	3.0	Across fractured, iron-stained white quartzite.	740 ppm	.6 ppm	322	6
1188	do.	5.0	Across fractured white quartzite with stringers of anglesite and cerussite.	1.75	.20	253	63
1189	do.	3.0	Across fractured white quartzite with galena stringers.	6.51	1.20	950	71
1190	do.	5.0	do.	6.51	.67	710	24
1191	do.	7.0	Across fractured white quartzite with galena and sphalerite.	4.55	1.05	.60%	40
1192	Grab	--	From dump of brown and white quartzite; the white quartzite contains galena and sphalerite.	2.46	1.02	.14%	15
1193	Random chip	--	Across fractured white quartzite.	14 ppm	.1 ppm	15	6

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1194	Chip	3.5	Across fractured white quartzite with anglesite or cerussite.	0.16	0.6 ppm	20	7
1195	do.	2.5	do.	13 ppm	.1 ppm	46	7
1196	do.	4.0	Across fractured and sheared brown quartzite.	1 ppm	.1 ppm	31	13
1197	Grab	--	From dump of brown and white quartzite with anglesite or cerussite and sphalerite.	1.90	.22	1.0%	11
1198	do.	--	From dump of brown and white quartzite with galena and sphalerite.	1.94	.49	.15%	17
1199	Select	--	From dump of galena and white quartzite with galena.	36.70	23.3	.45%	281
1200	Random chip	--	Across fractured white quartzite. (Ore House No. 8)	.50	.12	330	12
1201	Chip	1.5	Across fault zone containing gouge in phyllite.	350 ppm	1.0 ppm	38	34
1202	Grab	--	Of light gray and purple quartzite.	700 ppm	1.4 ppm	38	11
1203 1/	do.	--	Of light gray and white quartzite.	45 ppm	.1 ppm	43	10

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1204	Grab	--	From dump of white quartzite.	1.26	2.2 ppm	620	8
1205	do.	--	From dump of white and purple quartzite; the white quartzite contains galena.	3.60	.26	.22%	33
1206	do.	--	From dump of quarry workings of brown and white quartzite.	1.94	.22	530	20
1207	do.	--	do.	2.18	.52	720	26
1208	do.	--	From dump of quarry workings of white quartzite with galena.	2.84	.20	185	10
1209	Select	--	From dump of quarry workings of white quartzite with galena and sphalerite.	33.1	20.54	.55%	360
1210	Grab	--	do.	.32	.10	930	7
1211	do.	--	Of brown calcareous quartzite with galena and sphalerite.	.88	.14	780	15
1212	do.	--	do.	.70	.11	550	11
1213	do.	--	do.	.66	.32	310	9
1214	do.	--	do.	.75	.43	.13%	52

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1215	Grab	--	Of white and brown quartzite with bands of galena and sphalerite.	4.32	2.07	0.29%	105
1216	Select	--	Of white quartzite containing bands of galena, sphalerite,and malachite.	49.9	2.28	.20%	125
1217	do.	--	do.	41.1	.88	.72%	35
1218	Grab	--	Of brown calcareous quartzite and white quartzite with galena and sphalerite.	2.06	.25	.28%	16
1219	do.	--	Of brown and white quartzite.	940 ppm	.5 ppm	116	13
1220	do.	--	Of brown quartzite.	.32	1.8 ppm	330	7
1221	do.	--	Of white quartzite with galena, sphalerite, and malachite.	4.8	4.46	.15%	410
1222	Select	--	do.	46.6	10.06	374	340
1223	Grab	--	Of white quartzite with minor iron-staining.	.17	2.2 ppm	86	39
1224	do.	--	Of white and calcareous sandy quartzite.	.17	.11	820	15

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1225	Select	--	Of white quartzite containing galena, malachite, azurite, and iron oxide minerals.	4.0	1.93	0.24%	0.35%
1226	Chip	5.0	Across sheared white calcareous quartzite with disseminated pyrite(?).	4.67	.50	99	40
1227	do.	5.0	do.	7.99	.53	267	21
1228	do.	3.5	do.	7.35	.39	286	27
1229	do.	5.0	do.	2.37	.34	500	20
1230	Grab	--	Of white quartzite with disseminated galena and moderate limonite along fractures.	2.55	2.5 ppm	950	62
1231	Chip	5.8	Across altered brown quartzite with anglesite or cerussite.	4.0	.24	226	9
1232	Grab	--	From dump of brown quartzite and white quartzite with anglesite or cerussite, gouge, and iron-staining.	3.59	.17	472	11
1233	Chip	4.0	Across sheared white quartzite with limonite after pyrite psuedomorphs.	321 ppm	.2 ppm	40	2

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1234	Grab	--	Of brown and white quartzite.	233 ppm	0.1 ppm	51	11
1256	Chip	6.0	Across white quartzite.	118 ppm	.5 ppm	43	181
1257	do.	5.8	Across light gray quartzite with specks of pyrite(?).	240 ppm	.7 ppm	153	21
1258	do.	8.5	Across altered iron-stained quartzite with disseminated pyrite(?).	600 ppm	.6 ppm	250	25
1259	do.	7.9	do.	.20	1.0 ppm	130	23
1260	Grab	--	From dump of brown quartzite and white quartzite with stringers of galena and minor malachite.	.28	.10	306	36
1261	do.	--	From dump of white quartzite with stringers and blebs of galena.	1.67	.22	428	26
1262	do.	--	From dump of white quartzite with galena stringers and brown quartzite.	.66	.12	122	18
1263	Select	--	From dump of white quartzite containing galena, sphalerite, chalcocite, azurite, and malachite.	24.3	13.02	710	1.44%

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1264	Grab	--	Of brown quartzite and white quartzite containing galena, sphalerite, malachite, azurite, and chalcocite.	6.04	0.73	172	522
1265	Chip	2.5	Across white altered quartzite.	3.17	.27	38	23
1266	do.	5.2	Across white altered quartzite with minor banding of anglesite or cerussite.	2.7	.20	20	33
1267	Select	--	From dump of white quartzite with galena, malachite, and sphalerite.	49.9	2.63	0.20%	630
1268	Grab	--	Of brown quartzite and white quartzite with galena and malachite.	1.6	.15	540	31
1269	do.	--	Of brown quartzite	361 ppm	.2 ppm	30	11
1414 1/	Chip	1.0	Across shear zone in white quartzite.	4.32	.79	.15%	58
1415 2/	do.	1.0	Across shear zone in white quartzite with 2 in. band of galena.	6.63	.28	425	35
1416 1/	do.	2.7	Across altered white quartzite with galena stringers.	2.79	.64	.24%	22

TABLE B-5.--Sample data and descriptions for the Wilbert and Ore House Nos. 7 and 8--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead (%)	Silver (oz/ton)	Zinc (ppm)	Copper (ppm)
1417 2/	Chip	1.3	Across white quartzite gouge with galena stringers.	18.9	1.40	0.27%	54
1418	do.	.2	Across galena band in sheared white quartzite.	51.0	18.22	1.53%	.28%
1419	Grab	--	Of iron-stained white quartzite. (Ore House No. 8)	.11	1.1 ppm	120	28
1420	Select	--	Of white quartzite with bands of galena, anglesite, and cerussite. (Ore House No. 7)	18.8	.70	1.11%	82
1421	Chip	4.0	Across sheared brown quartzite with minor galena stringers. (Ore House No. 7)	1.87	2.7 ppm	.16%	17
1422	do.	5.9	Across fractured white quartzite with disseminated galena. (Ore House No. 7)	.76	1.7 ppm	106	14

1/ Also contains 5 ppb gold.
2/ Also contains 15 ppb gold.

NAME: Great Western mine

AKA: Ingersoll mine; La Riviere Perdu Nos. 18-24

OWNER: Bill Yearsley and others, Menan, ID 83434

MAP NO.: Plate 1, No. 74

LOCATION: E1/2 sec. 8, T. 7 N., R. 29 E.

ELEVATION: 7,100 to 7,500 ft

ACCESS: From Howe, ID, take the Pahsimeroi (Little Lost River Valley) road 13 mi north; then take dirt road 5.5 mi northeasterly to Waymire Ranch and North Creek; take jeep trail 2 mi southerly to mine. The mine is in the western foothills of the Lemhi Range and is readily accessible throughout the year.

HISTORY: According to Umpleby (1914), the Great Western mine was located about 1880; the earliest recorded claim was located in 1882 by Charles Blackburn. The Great Western and the Ingersoll were relocated several times over the past century. About 1922, Aredale Mines Inc. applied for a patent of the Great Western and Ingersoll claims; two other claims to the west, the Bluebird and the Aredale, were not included. The mines were surveyed (MS 2992) but never patented. The current owners relocated the mine as the La Riviere Perdu claims in 1982. Between 1985 and 1986, they produced about 60 tons of silver ore (Yearsley, personal communication, 1986).

More than 700 tons of ore containing lead, silver, and minor amounts of copper were produced between 1907 and 1960; average grades ranged between 6 and 58% lead, 1 and 131 oz/ton silver, and 0.06 and 3% copper. About $50,000 of ore were produced prior to 1914, and ore was shipped to the smelter at Nicholia, Idaho for processing (Umpleby, 1914, p. 216, 212).

GEOLOGY: The mine is in the lower Ordovician Summerhouse Formation (Ruppel and others, 1975) that is composed of interbedded quartzite, dolomite, and dolomitic or calcareous quartzite, just west of the thrust fault contact (Great Western) with the Ordovician Kinnikinic Quartzite (pl. 2) (Beutner, 1968, pl. 1). Anderson (1948, p. 14) describes the quartzite as being carbonatized, or having been replaced with carbonate. The Great Western thrust fault was mapped by Anderson (1948, pl. 1) and Ross (1961, pl. 7), and is west of and parallel to the northwest-trending Black Canyon thrust fault. The fault is offset locally at the Great Western property by two east-west trending faults (pl. 2). Ore and mineralized zones occur in dolomite and dolomitic quartzite units similar to the Wilbert mine two miles to the north (Umpleby, 1917, p. 118; Ross, 1933, p. 7). Mineralization is structurally controlled at the Great Western and is found along shear zones and bedding plane faults. No associated igneous dikes have been found at this location; however, a remote igneous body may be the source of mineralizing fluids

NAME: Great Eastern [illegible]

AKA: Ingersoll Mine; [illegible]

OWNER: [illegible]

MAP NO.: Plate 1, No. 13

LOCATION: [illegible] sec. [illegible], T. [illegible] N., R. [illegible] E.

ELEVATION: 7,100 to 7,600 ft

ACCESS: [illegible] throughout the year.

HISTORY: According to [illegible] the Great Eastern [illegible] was located about [illegible] Charles [illegible] The Great Eastern [illegible] several times over the next [illegible] About [illegible] other claims in the area [illegible] The [illegible] current owners [illegible] in [illegible] 1982. Between [illegible] (written communication, [illegible]).

[illegible] of [illegible] were [illegible] between [illegible] and [illegible] average grades [illegible] exposed on the surface [illegible]

GEOLOGY: The mine is in the lower [illegible] Formation [illegible] dolomite, [illegible] fault [illegible] Ross (1991) [illegible] fault. [illegible] however, [illegible] which used the faults as conduits. Vein and replacement lenses and pods contain high-grade pockets of silver minerals, argentiferous galena, cerussite, hemimorphite, and copper minerals. Metallic minerals are also found disseminated within the wallrock. The main mineralized dolomite unit occurs at the fault contact between the Kinnikinic Quartzite and the Summerhouse Formation; it can be traced for about 2,300 ft along strike at this property (pl. 2). The unit is about 60 ft wide, strikes N. 10°-20° W., and dips 70°-80° SW. Mineralized bodies in this unit are discontinuous. The largest ore body at the adit at 7,228 ft elevation is 95 ft long, about 7.5 ft wide, and 50 ft deep (fig. B-22). A smaller mineralized dolomitic quartzite unit occurs within the Summerhouse Formation along a bedding plane fault that can be traced for about 75 ft in the adit at elevation 7,146 ft (fig. B-14).

WORKINGS: The property contains 19 adits with more than 4,000 ft of total workings, three caved adits, one of which was 650 ft long with a 45 ft winze (Kiilsgaard, 1952), six shafts, including an 82 ft inclined shaft, 35 trenches, and eight pits (Pl. 2, figs. B-12 to B-23).

SAMPLE RESULTS: Two hundred sixty four samples were collected including 227 chip, 9 select, 26 grab, and 2 random chip samples. Assay data for these samples are presented on table B-6. Some samples were analyzed only for gold and silver.

RESOURCE ESTIMATE: Four adits contained sufficient tonnage to calculate resources. About 4,900 tons of subeconomic indicated resources remain in pockets that average 1.7 oz/t silver, 3.6% lead, and 0.5% copper. Measurements used for calculation are as follows:

Adit	Strike Length	Dip Length	Average Width
Fig. B-15	265	25	2.4
Fig. B-21	100	60	3.4
Fig. B-19	63	67	2
Fig. B-22	95	50	7.5

Surface intercept of the adit in Fig. B-22 subtracted 1,053 tons from the total block. A tonnage factor of 11.5 ft^3/t was used. No inferred resources were calculated due to the pinch and swell nature of the veins.

CONCLUSIONS: Sampling indicates low-grade mineralization occurs in dolomitic or calcareous quartzite units as veins, lenses, or pods in shear zones. Known high-grade ore pockets in the old workings appear to be mined out.

In 1986 and 1987, the current claim owners were mining high-grade pockets by underground resuing methods where they would handsort the ore from the waste, and then ship the concentrates to a mill and smelter. They used leased and used equipment for their operations. In 1988, mining activity ceased for unknown reasons.

A hypothetical family-type operation of three people using an underground resuing method could operate the mine for about $37/ton (Stebbins, 1989, personal communication). It may be economic for a small mining operation to mine high-grade pockets of ore. However, because of the discontinuous nature of these pockets, over the long term the mining operation may just barely break even. Adding other costs, such as transportation of hand-sorted ore, milling and smelter charges, and road maintenance may make this operation subeconomic.

Additional resources may be found at this property, but complex folding and faulting make following existing structures difficult, and in some cases, may cut off or pinch out existing mineralized zones. Additional work is needed to determine the size, extent, continuity, and grade of mineralized shear zones in the dolomitic units. Similar mineralized areas are found to the north, outside the study area, at the Wilbert and Lookout mines, and at minor prospects at the La Riviere Perdu Nos. 6 and 7. To the south, the Summerhouse Formation is at the base of the Lemhi Range, and would be difficult to explore. Additional exploration is necessary to determine if similar mineralized areas extend to the north and south of the mine.

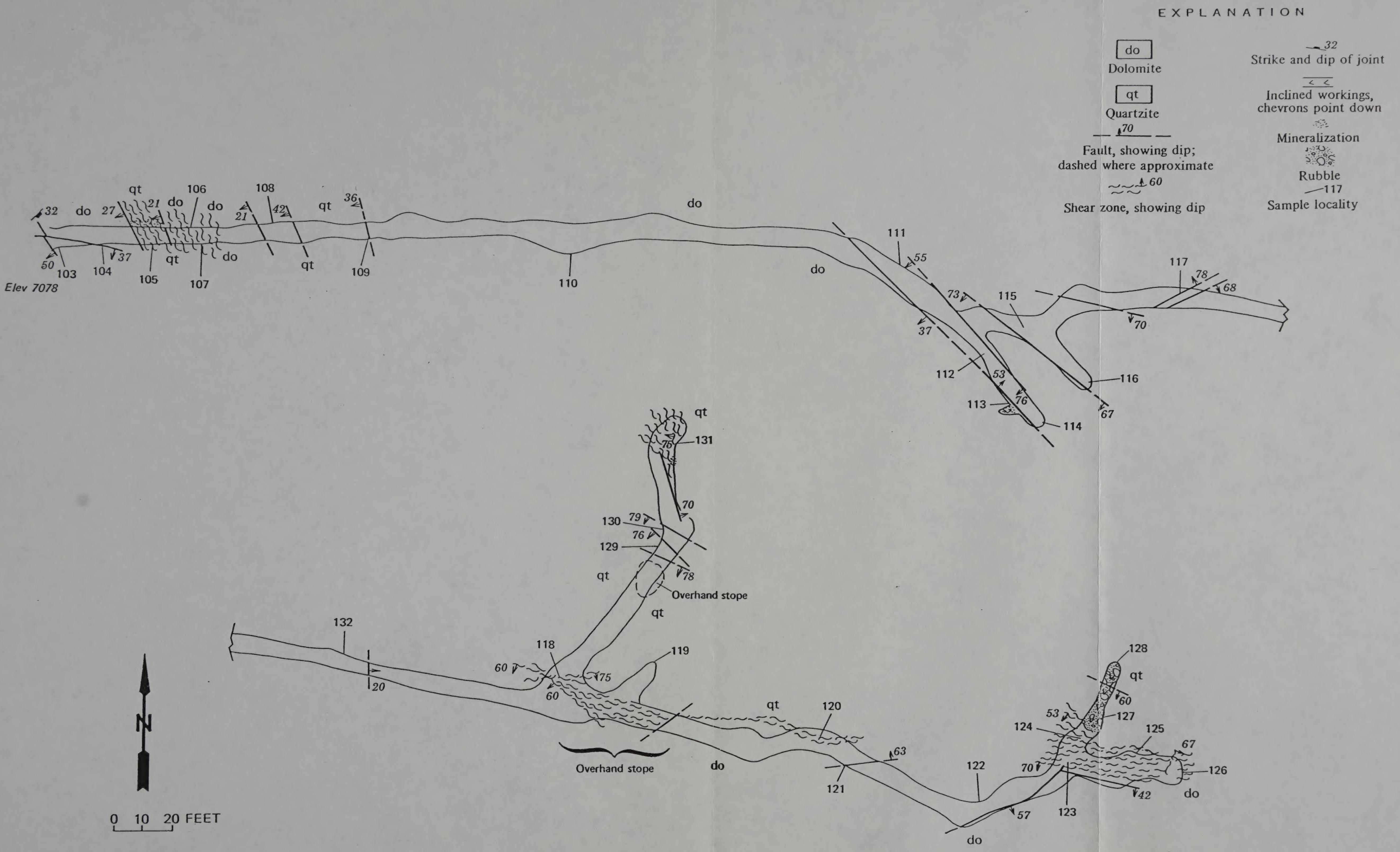

EXPLANATION
do
Dolomite
qt
Quartzite
70
Fault, showing dip; dashed where approximate
60
Shear zone, showing dip
32
Strike and dip of joint
Inclined workings, chevrons point down
Mineralization
Rubble
117
Sample locality
Elev 7078
32
do
27
qt
21
106
do
108
21
42
36
qt
do
50
103
104
37
105
107
do
qt
109
110
do
111
55
73
37
115
117
78
68
70
112
53
113
76
114
116
67
qt
131
76
70
130
79
76
129
78
qt
Overhand stope
qt
132
20
118
60
75
60
119
qt
120
Overhand stope
do
63
121
122
128
qt
60
53
127
124
125
67
70
126
42
do
123
57
do
N
0 10 20 FEET

FIGURE B-12.– Underground map, adit at elevation 7078 ft, Great Western mine

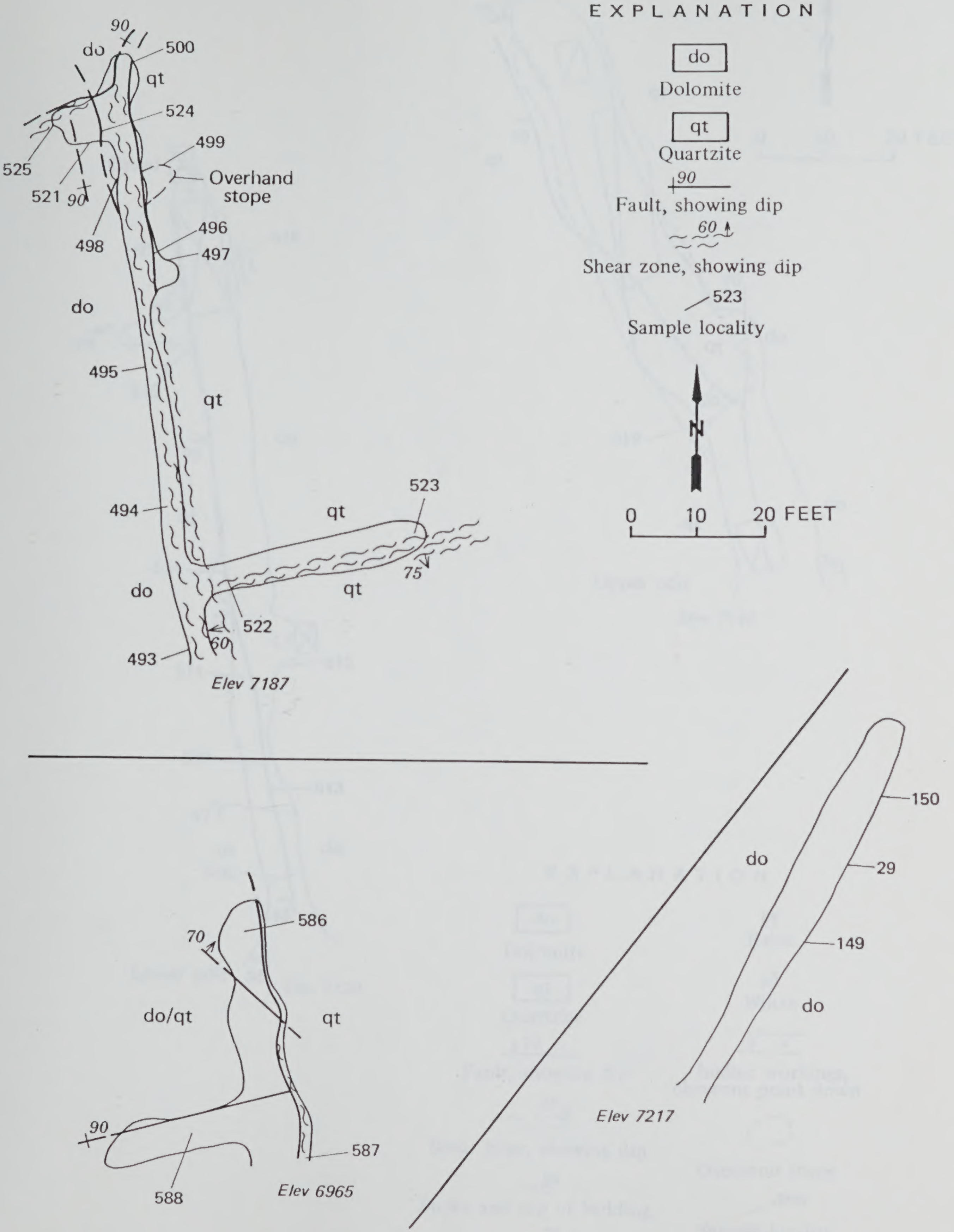

EXPLANATION
do
Dolomite
qt
Quartzite
90
Fault, showing dip
60
Shear zone, showing dip
523
Sample locality
N
0
10
20 FEET
90
do
500
qt
524
499
525
521
90
Overhand stope
498
496
497
do
495
qt
523
494
qt
75
do
qt
522
60
493
Elev 7187
586
70
do/qt
qt
90
587
588
Elev 6965
150
do
29
149
do
Elev 7217

FIGURE B-13.– Underground maps, adits at elevations 6965 ft, 7187 ft and 7217 ft, Great Western mine

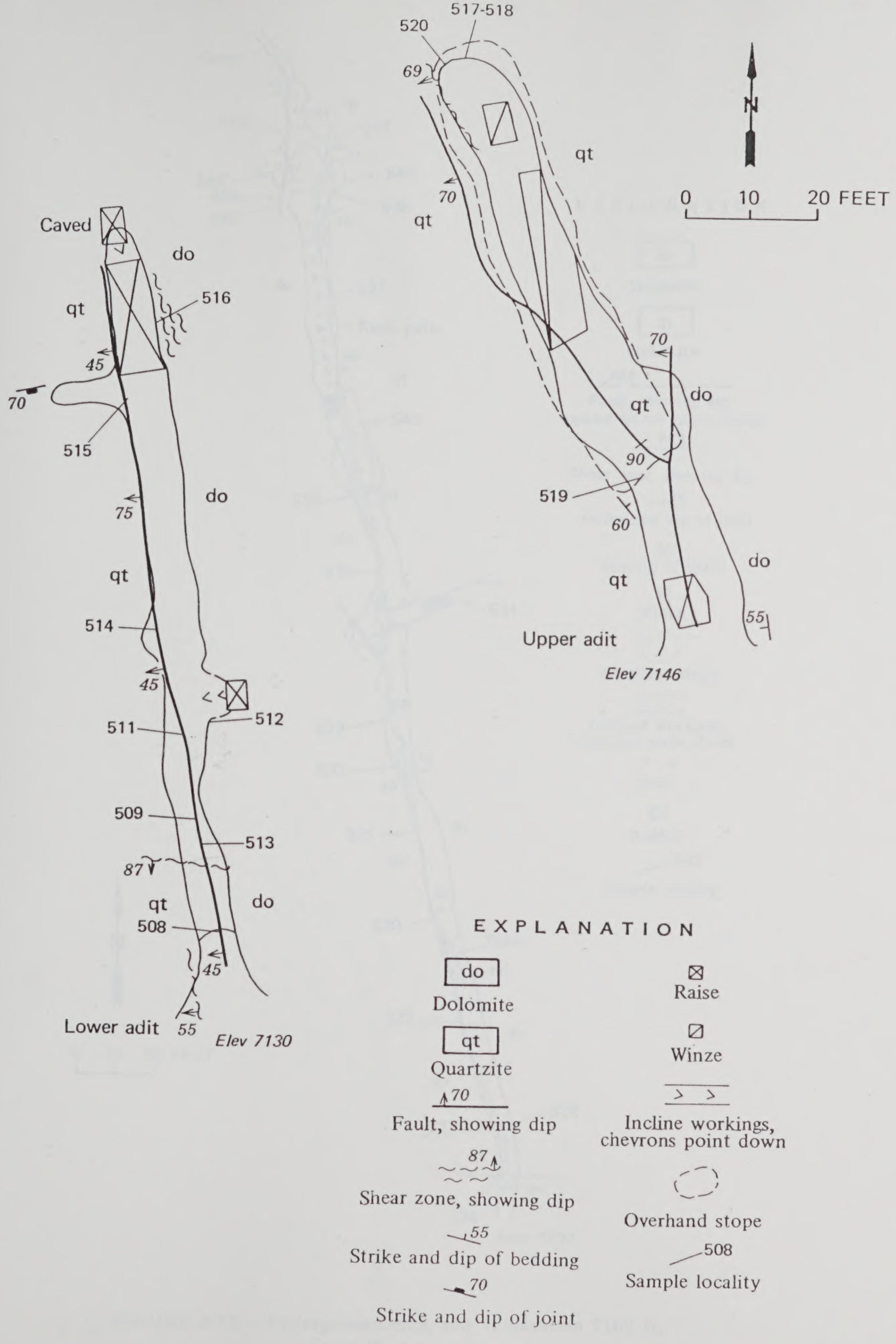

517-518
520
69
70
qt
qt
0 10 20 FEET
Caved
do
516
qt
45
70
515
do
75
qt
514
45
512
511
509
513
87
qt
do
508
45
Lower adit
55
Elev 7130
70
do
qt
90
519
60
do
qt
55
Upper adit
Elev 7146
EXPLANATION
do
Dolomite
qt
Quartzite
70
Fault, showing dip
87
Shear zone, showing dip
55
Strike and dip of bedding
70
Strike and dip of joint
Raise
Winze
Incline workings, chevrons point down
Overhand stope
508
Sample locality

FIGURE B-14.– Underground maps, adits at elevations 7130 ft and 7146 ft, Great Western mine

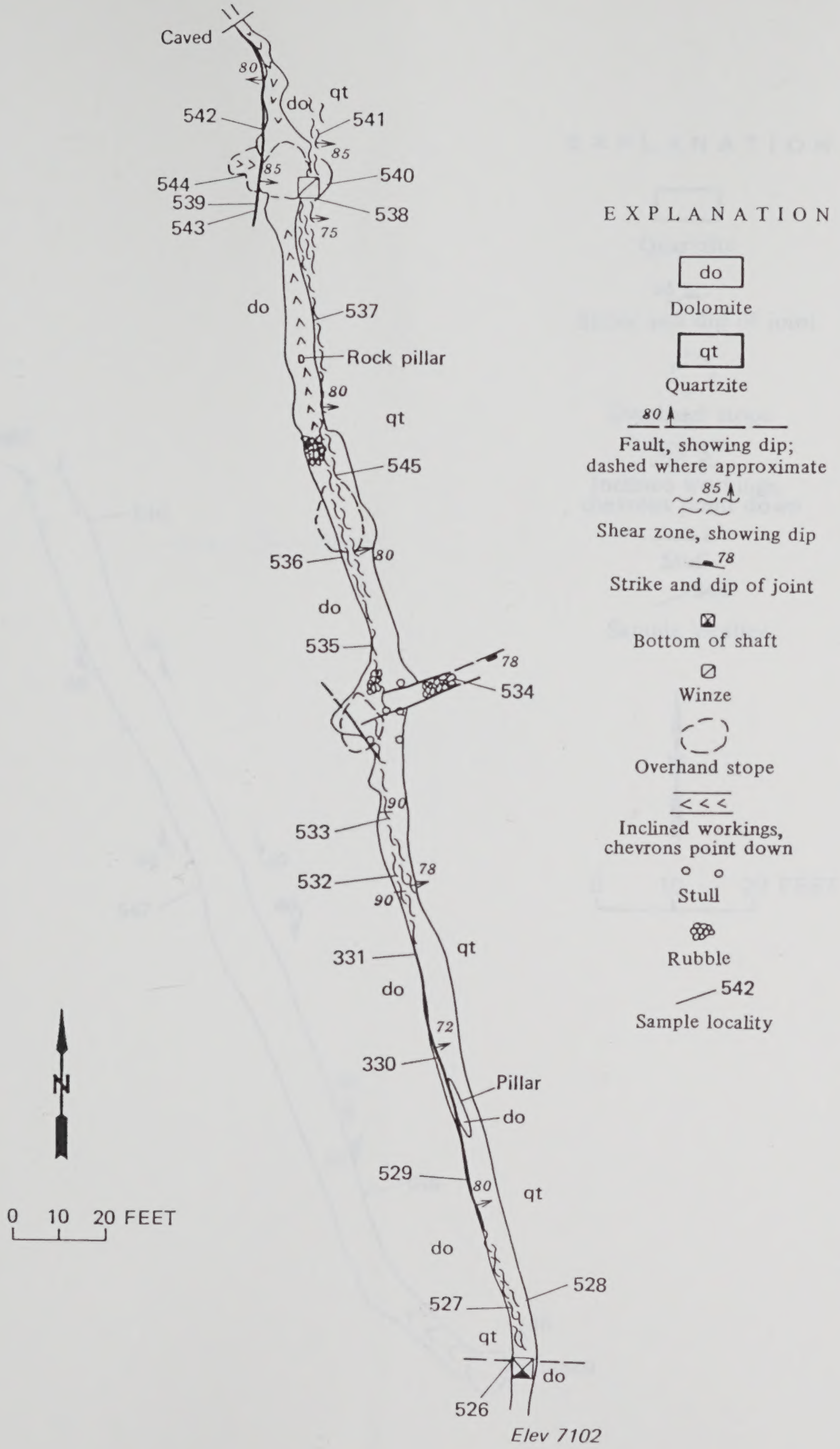

Caved
80
do
qt
542
541
85
544
539
543
85
540
538
75
do
537
Rock pillar
80
qt
545
80
536
do
535
78
534
90
533
78
532
90
331
qt
do
72
330
Pillar
do
529
80
qt
do
528
527
qt
do
526
Elev 7102
N
0 10 20 FEET
EXPLANATION
do
Dolomite
qt
Quartzite
80
Fault, showing dip; dashed where approximate
85
Shear zone, showing dip
78
Strike and dip of joint
Bottom of shaft
Winze
Overhand stope
< < <
Inclined workings, chevrons point down
Stull
Rubble
542
Sample locality

FIGURE B-15.– Underground map, adit at elevation 7102 ft, Great Western mine

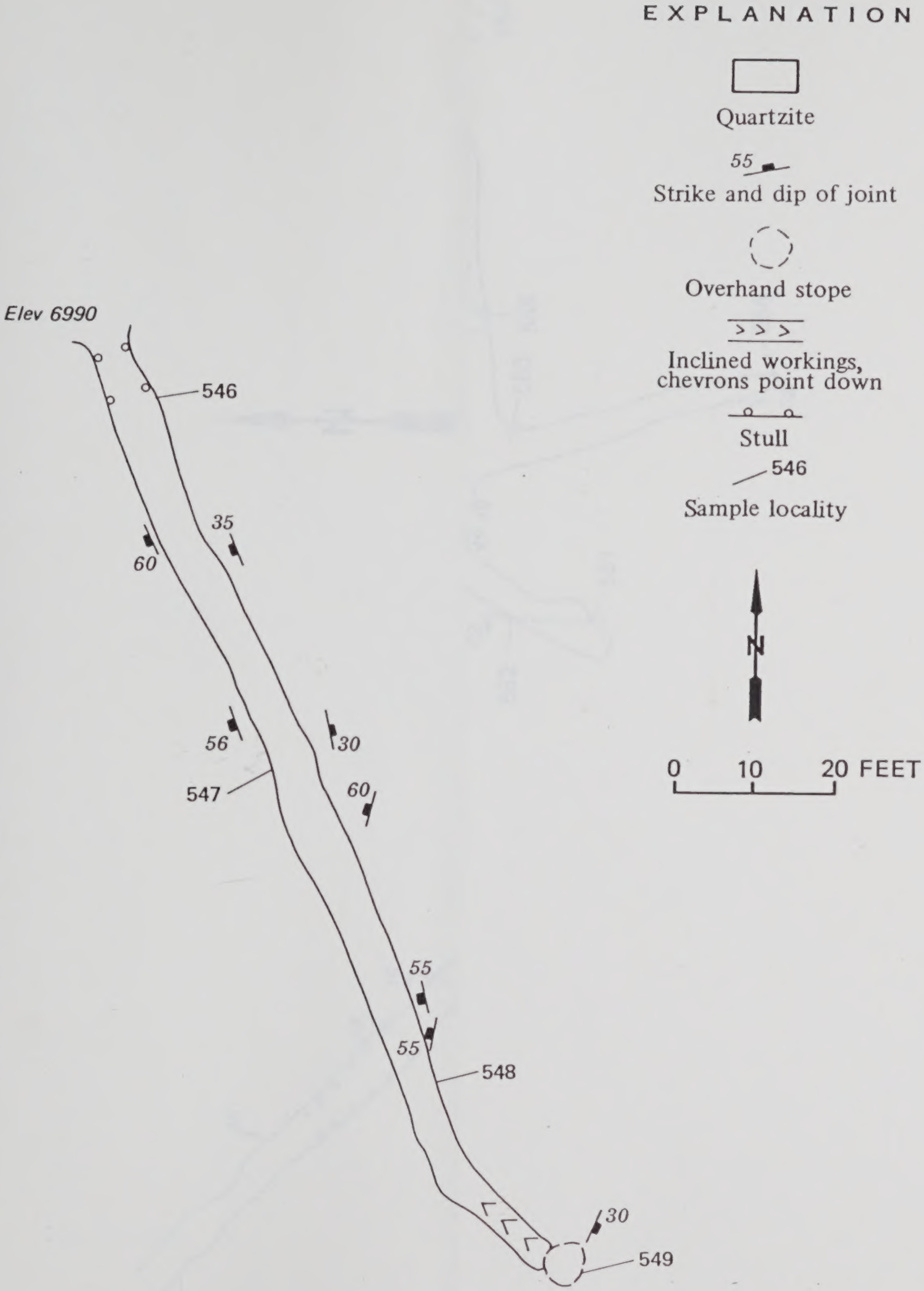

EXPLANATION
Quartzite
55
Strike and dip of joint
Overhand stope
Inclined workings, chevrons point down
Stull
546
Sample locality
N
0
10
20 FEET
Elev 6990
546
35
60
56
30
547
60
55
55
548
30
549

FIGURE B-16.– Underground map, adit at elevation 6990 ft, Great Western mine

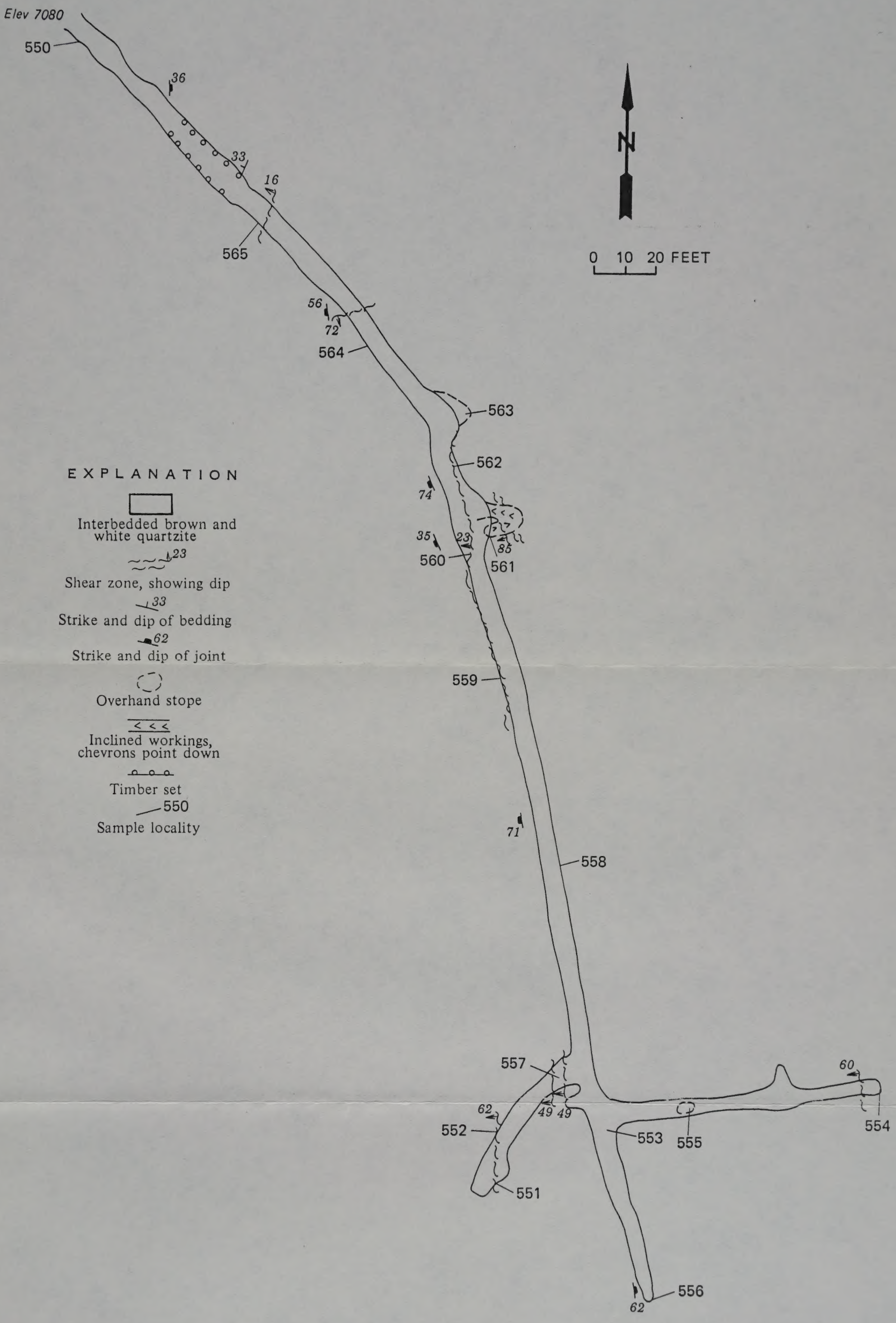

Elev 7080
550
36
33
16
565
56
72
564
563
562
74
35
23
85
560
561
559
71
558
557
62
49
49
552
551
553
555
60
554
556
62
N
0 10 20 FEET
EXPLANATION
Interbedded brown and white quartzite
23
Shear zone, showing dip
33
Strike and dip of bedding
62
Strike and dip of joint
Overhand stope
Inclined workings, chevrons point down
Timber set
550
Sample locality

FIGURE B-17.– Underground map, adit at elevation 7080 ft, Great Western mine

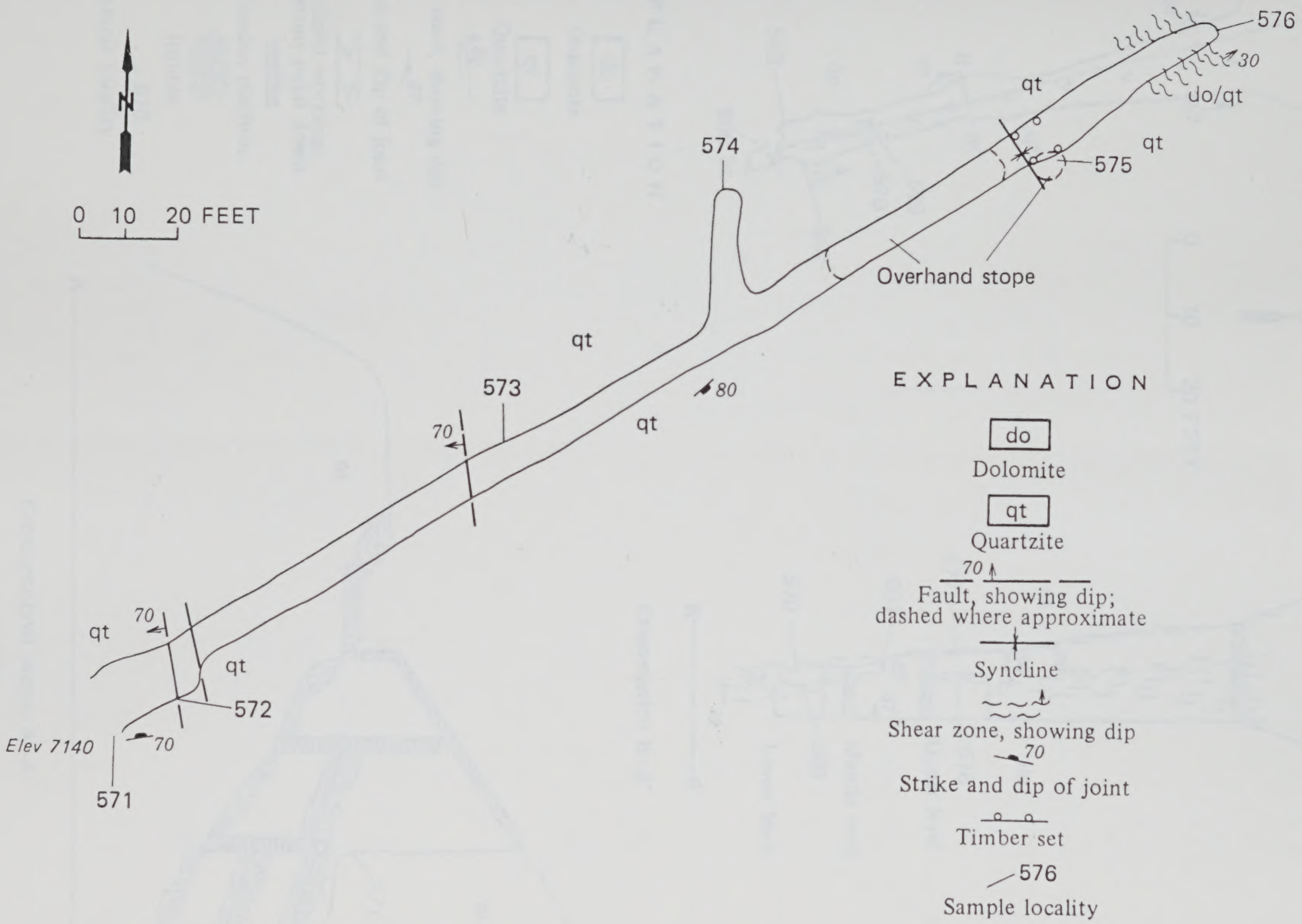
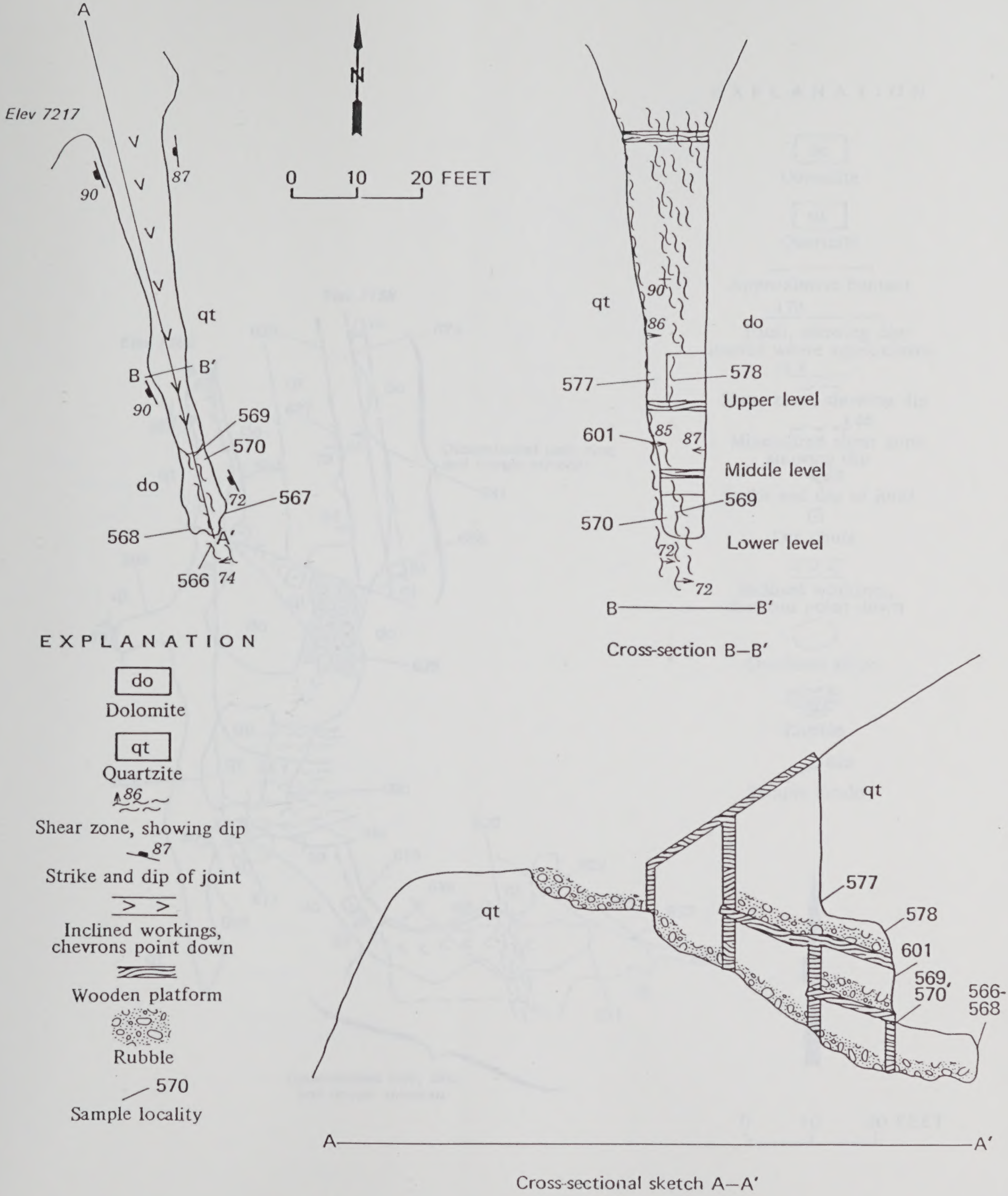

N
0 10 20 FEET
576
30
do/qt
qt
qt
574
575
Overhand stope
qt
573
70
80
qt
qt
70
qt
qt
572
Elev 7140
70
571
EXPLANATION
do
Dolomite
qt
Quartzite
70
Fault, showing dip; dashed where approximate
Syncline
Shear zone, showing dip
70
Strike and dip of joint
Timber set
576
Sample locality

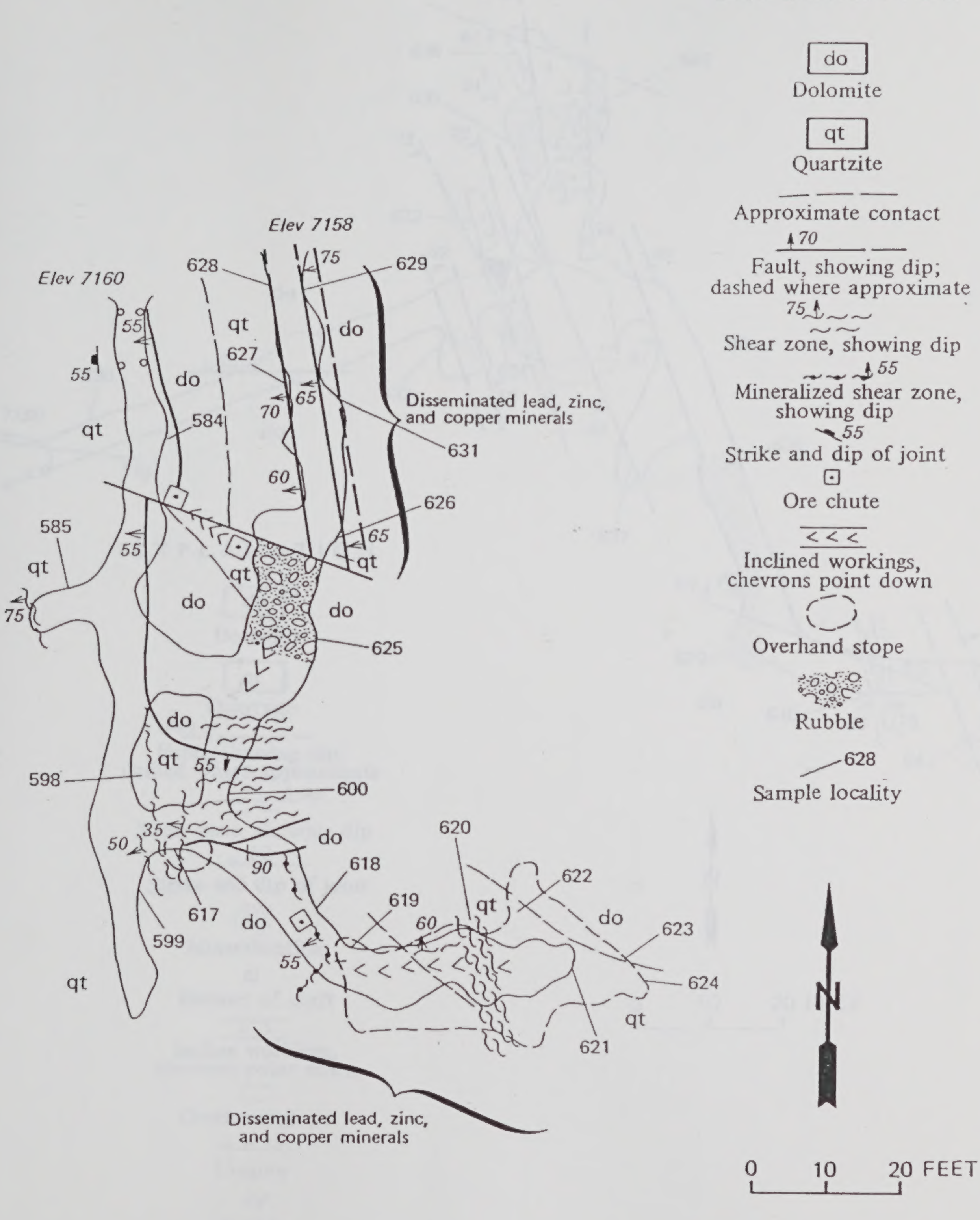
FIGURE B-18.– Underground map, adit at elevation 7140 ft, Great Western mine


A
Elev 7217
V
87
90
0
10
20 FEET
N
qt
B
B'
90
569
570
do
72
567
568
A'
566
74
qt
90
86
do
577
578
Upper level
601
85
87
Middle level
570
569
Lower level
72
72
B
B'
EXPLANATION
do
Dolomite
qt
Quartzite
86
Shear zone, showing dip
87
Strike and dip of joint
Inclined workings, chevrons point down
Wooden platform
Rubble
570
Sample locality
qt
qt
577
578
601
569, 570
566-568
A
A'

Cross-section B—B'

Cross-sectional sketch A—A'
not to scale

FIGURE B-19.—Underground map, inclined shaft at elevation 7217 ft, Great Western mine



EXPLANATION
do
Dolomite
qt
Quartzite
Approximate contact
70
Fault, showing dip; dashed where approximate
75
Shear zone, showing dip
55
Mineralized shear zone, showing dip
55
Strike and dip of joint
Ore chute
Inclined workings, chevrons point down
Overhand stope
Rubble
628
Sample locality
N
0
10
20 FEET
Elev 7160
Elev 7158
628
629
75
55
qt
do
627
55
do
65
70
Disseminated lead, zinc, and copper minerals
qt
584
631
60
626
585
55
65
qt
qt
qt
75
do
do
625
do
qt
55
598
600
35
do
620
50
90
618
622
617
619
qt
do
do
60
623
599
55
624
qt
qt
621
Disseminated lead, zinc, and copper minerals

FIGURE B-20.– Underground map, adit at elevation 7160 ft, Great Western mine

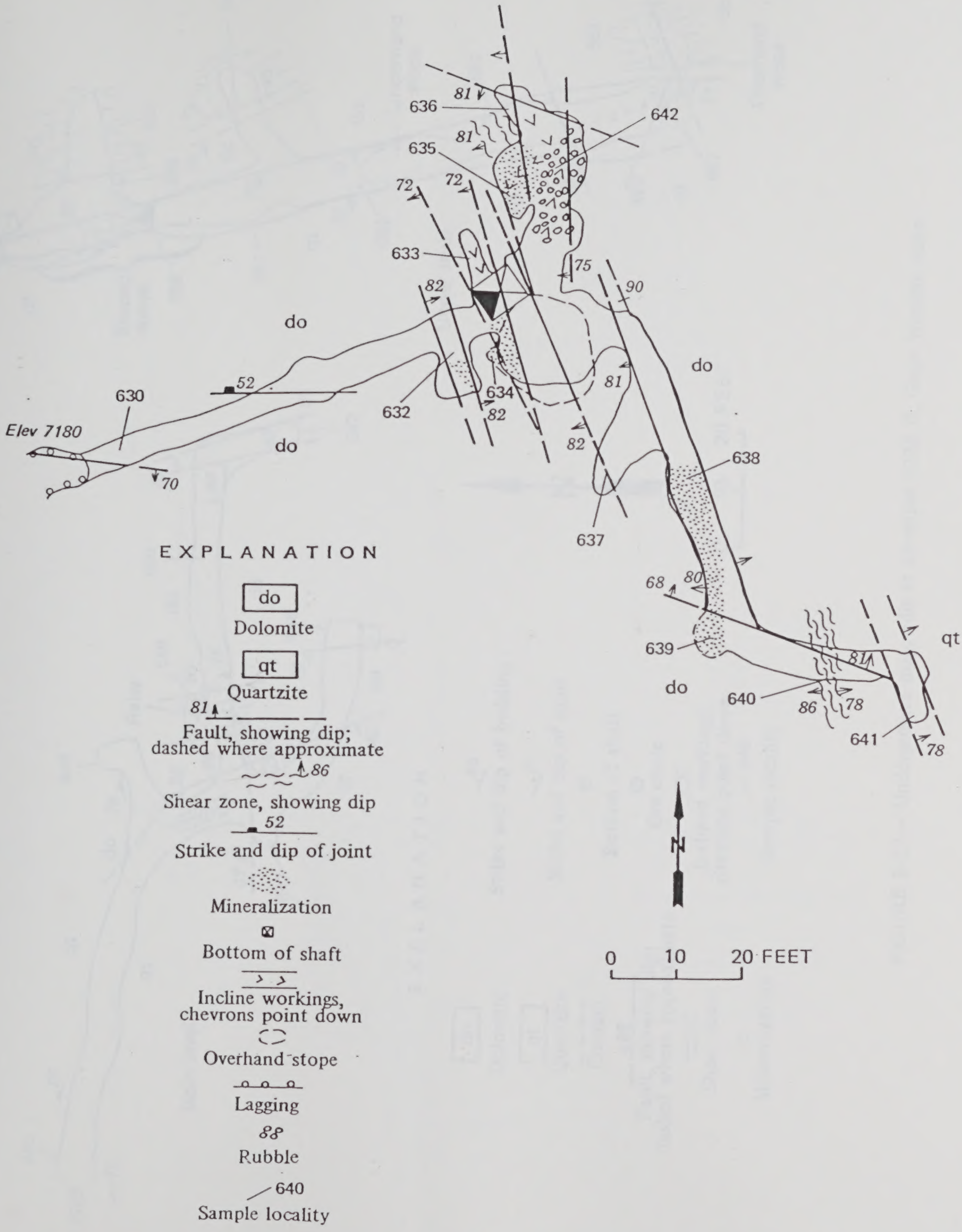

636
81
642
635
81
72
72
633
75
82
90
do
630
52
632
634
81
do
Elev 7180
82
82
do
70
638
637
68
80
qt
639
81
do
640
86
78
641
78
EXPLANATION
do
Dolomite
qt
Quartzite
81
Fault, showing dip; dashed where approximate
86
Shear zone, showing dip
52
Strike and dip of joint
Mineralization
Bottom of shaft
Incline workings, chevrons point down
Overhand stope
Lagging
Rubble
640
Sample locality
N
0
10
20 FEET

FIGURE B-21.– Underground map, adit at elevation 7180 ft, Great Western mine

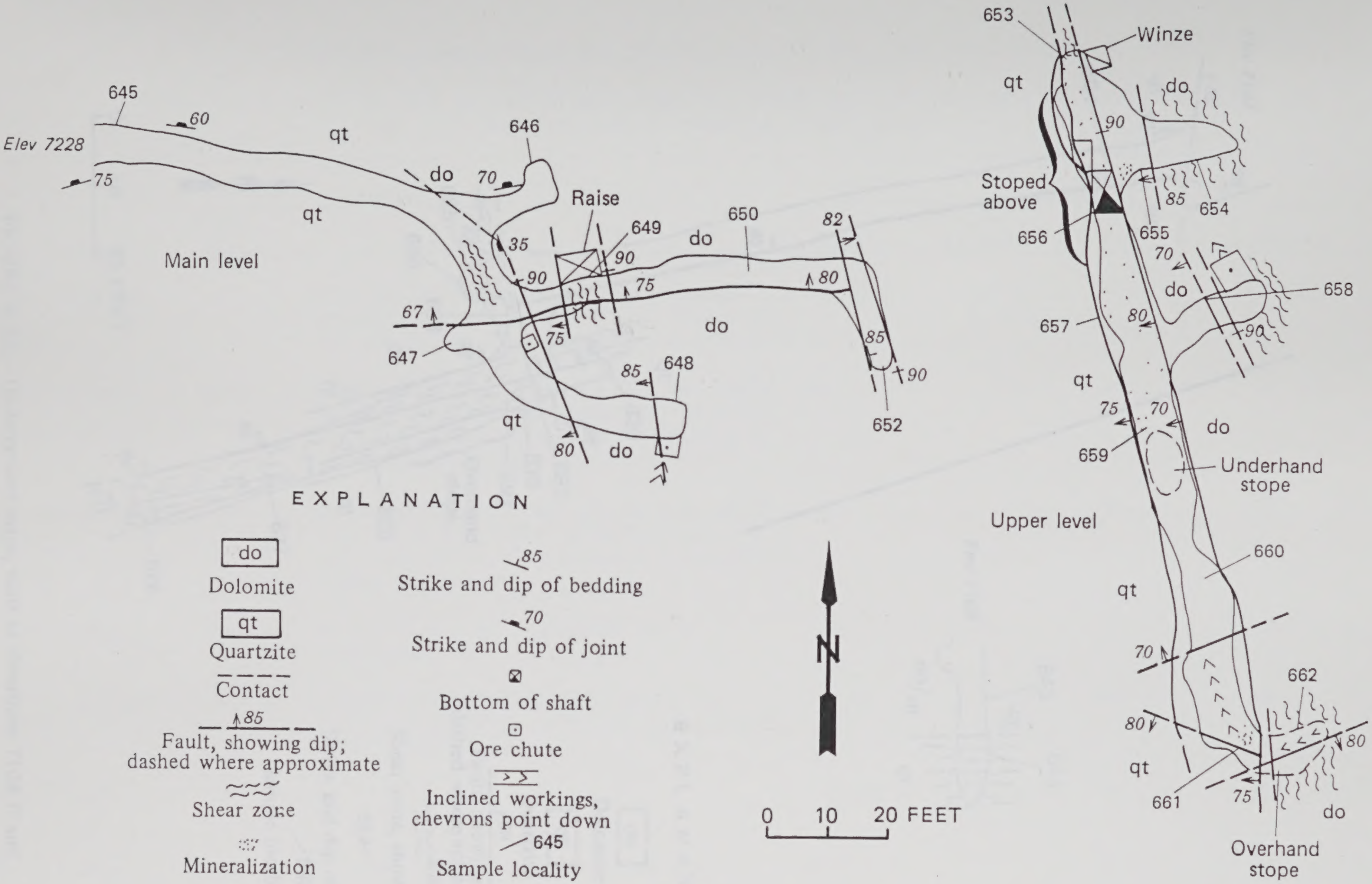

645
Elev 7228
60
75
qt
646
do
70
Raise
35
649
90
650
do
82
90
75
80
Main level
67
647
do
75
85
648
85
90
qt
80
do
652
653
Winze
qt
do
90
Stoped above
85
654
656
655
70
658
do
657
80
90
qt
75
70
do
659
Underhand stope
Upper level
660
qt
70
662
80
80
qt
661
75
do
Overhand stope
EXPLANATION
do
Dolomite
qt
Quartzite
Contact
85
Fault, showing dip; dashed where approximate
Shear zone
Mineralization
85
Strike and dip of bedding
70
Strike and dip of joint
Bottom of shaft
Ore chute
Inclined workings, chevrons point down
645
Sample locality
N
0
10
20 FEET

FIGURE B-22.– Underground map, adit at elevation 7228 ft, Great Western mine

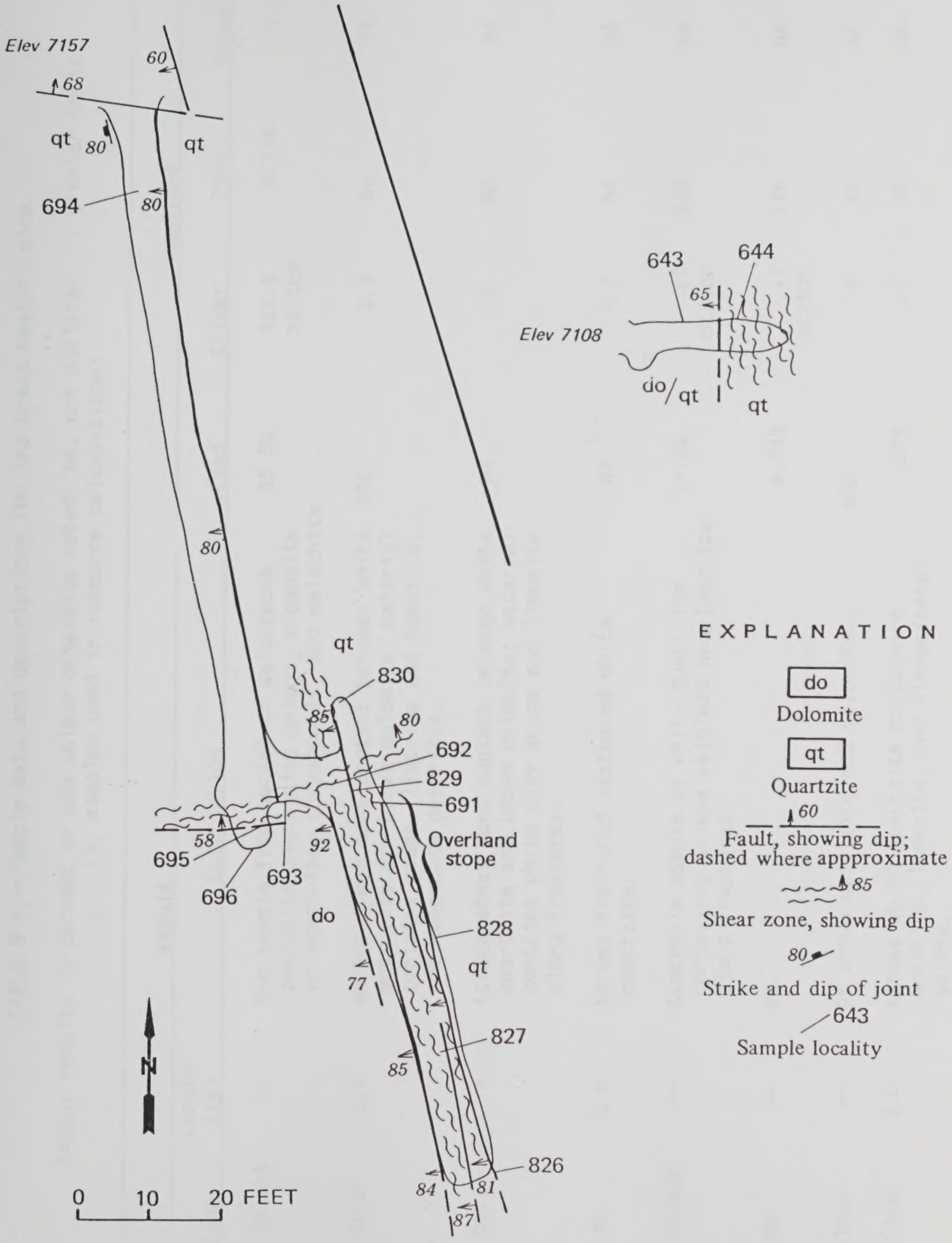

Elev 7157
68
60
qt
80
qt
694
80
80
Elev 7108
643
644
65
do/qt
qt
qt
830
85
80
692
829
691
Overhand stope
58
92
695
696
693
do
828
qt
77
827
85
826
84
81
87
0
10
20 FEET
N
EXPLANATION
do
Dolomite
qt
Quartzite
60
Fault, showing dip; dashed where appproximate
85
Shear zone, showing dip
80
Strike and dip of joint
643
Sample locality

FIGURE B-23.– Underground maps, adits at elevations 7108 ft and 7157 ft, Great Western mine

TABLE B-6.--Sample data and descriptions for the Great Western mine

(Assay results in percent or ppm unless otherwise noted; NA, not analyzed; >, greater than)
(*, samples used in resource calculations)

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
12	Select	--	Ore sample from bucket of calcareous quartzite containing galena, argentite or acanthite, chrysocolla, and malachite.	35.5%	122.8 oz/ton	0.11%	0.32%
28	Chip	0.8	Across shear zone contact between white quartzite and brown dolomite; material contains gouge, limonite and hematite, and manganese dendrites.	550	2.8	54	75
29	do.	.4	Across shear zone contact between white quartzite and brown dolomite; material contains white clay gouge and limonite along fractures.	NA	.3	NA	NA
30	do.	3.5	Across fractured weathered white quartzite.	NA	4.7	NA	NA
31	Select	--	Stockpile sample of white quartzite containing galena veinlets and limonite along fractures.	14.5%	.67 oz/ton	540	NA
32	do.	--	do.	6.04%	.47 oz/ton	136	NA
33	Grab	--	Of brown quartzite and dolomite.	600	.1	35	NA
34	Chip	3.0	Across white quartzite containing goethite, limonite, and disseminated galena.	.23%	.4	97	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
35	Chip	8.0	Across white quartzite with minor iron staining.	NA	0.1	NA	NA
36	do.	2.8	Across brown dolomite and quartzite with minor iron staining and caliche.	NA	.4	NA	NA
37	do.	2.8	Across shear zone in white quartzite containing gouge and iron staining.	100	.3	16	NA
38	do.	8.5	Across fractured purple quartzite with minor iron staining.	NA	.2	NA	NA
39	do.	4.0	Across brown dolomite and quartzite.	NA	.1	NA	NA
40	do.	2.3	Across white quartzite with minor chlorite, limonite blebs, and iron and manganese staining.	NA	.1	NA	NA
41	do.	3.8	Across fractured brown quartzite.	340	.2	150	NA
42	do.	2.5	Across fractured white quartzite with minor iron staining along fractures.	NA	.3	NA	NA
43	do.	3.0	Across fractured brown quartzite.	NA	.1	NA	NA
44	do.	1.5	Across heavily iron-stained fractured white quartzite.	4	.1	NA	NA
45	do.	3.0	Across fractured white quartzite with chlorite and minor manganese staining along fractures.	6	.1	1	9

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
46	Grab	--	Of purple dolomite and calcareous quartzite with minor limonite blebs along fractures.	13	0.1	13	17
47	do.	--	Dump sample of soil, white quartzite, and brown dolomite with limonite.	.56%	6.93 oz/ton	.08%	121
48	do.	--	Dump sample of soil and siliceous dolomite with limonite.	.14%	.20 oz/ton	810	40
49	Select	--	Stockpile sample of white quartzite with galena veinlets and malachite, limonite, and manganese staining; argentiferous.	22.6%	8.52 oz/ton	750	740
50	Grab	--	Dump sample of soil, white quartzite, and brown quartzite.	.44%	3.8	220	14
53	Select	--	Ore sample of white quartzite containing veinlets of galena and chalcocite; argentiferous.	19.5%	36.8 oz/ton	.15%	.17%
103	Chip	2.6	Across fractured and sheared dolomite with minor iron staining.	98	.5	125	62
104	do.	4.0	do.	NA	.4	NA	NA
105	do.	3.5	Across fractured quartzite with minor iron staining.	NA	.6	NA	NA
106	do.	4.3	do.	103	.1	44	26

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
107	Chip	2.3	Across fractured and sheared dolomite with iron staining along fractures.	140	0.2	290	23
108	do.	6.8	Across massive, fractured quartzite with minor iron staining.	22	.1	14	NA
109	do.	2.1	Across sheared and fractured brown quartzite with clay gouge in shears and minor iron staining.	NA	.1	NA	NA
110	do.	5.5	Across sheared and fractured brown quartzite with clay gouge in shears and heavy iron staining.	NA	.1	NA	NA
111	do.	2.8	Across sheared and altered dolomite.	630	.9	295	NA
112	do.	4.5	Across sheared dolomite with limonite veinlets.	NA	.2	NA	NA
113 1/	do.	4.0	Across altered dolomite and quartzite with cerrusite and calcite or siderite veinlets.	950	1.5	390	NA
114	do.	3.7	Across fractured brown quartzite with calcite veinlets.	NA	.1	NA	NA
115	do.	5.6	Across shear zone in iron-stained dolomite and brown quartzite with calcite siderite veinlets.	NA	.1	NA	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
116	Chip	5.0	Across fractured iron-stained brown quartzite with calcite or siderite veinlets.	NA	0.1	NA	NA
117	do.	4.6	Across sheared and fractured dolomite and quartzite with iron staining, and calcite or siderite veinlets.	NA	.1	NA	NA
118	do.	2.3	Across sheared, weathered white quartzite.	NA	.1	NA	NA
119	do.	4.0	Across fractured purple quartzite with interbeds of green quartzite.	75	.3	16	NA
120 2/	do.	1.4	Across gouge zone in white quartzite with some iron staining.	20	.1	23	10
121 1/	do.	.2	Across decomposed dolomite and quartzite with iron staining.	68	.2	126	NA
122	do.	4.2	Across sheared and fractured calcareous quartzite with some iron staining.	NA	.1	NA	NA
123	do.	8.0	Across sheared and fractured white quartzite with some iron staining.	9	.1	30	9
124	do.	9.0	Across sheared purple quartzite with interbedded green quartzite.	NA	.1	NA	NA
125	do.	6.0	Across fault gouge zone in white quartzite with some iron staining.	36	.7	11	6

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
126	Chip	5.0	Across sheared and fractured dolomite and quartzite with iron staining and calcite veinlets.	NA	0.1	NA	NA
127	do.	3.7	Across fractured purple quartzite.	NA	.1	NA	NA
128	do.	2.0	Across green and white quartzite.	NA	.1	NA	NA
129	do.	5.1	Across decomposed green quartzite.	NA	.1	NA	NA
130	do.	6.7	Across sheared white quartzite with some iron and manganese staining.	59	.3	83	NA
131	do.	1.3	Across sheared and fractured white quartzite.	2	.1	15	6
132	do.	2.3	Across waterlogged calcareous brown quartzite with iron and manganese staining.	NA	.8	NA	NA
134	do.	6.5	Across brown quartzite with calcite veinlets and manganese staining.	650	3.1	156	75
135	do.	6.6	Across white quartzite with limonite veinlets.	NA	.2	NA	NA
136	do.	2.6	Across brown quartzite.	51	.2	72	14
137	do.	.7	Across sheared decomposed brown quartzite with minor manganese staining.	240	2.1	69	NA
138	Grab.	--	Dump sample of soil and brown quartzite.	NA	.3	NA	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
148	Chip	7.5	Across brown dolomite with minor iron staining.	NA	1.1	NA	NA
149	do.	6.0	do.	NA	.4	NA	NA
150	do.	5.8	do.	NA	.5	NA	NA
456 3/	do.	5.0	Across fractured white quartzite with galena veinlets with limonite.	1.27%	.22 oz/ton	0.21%	15
457	do.	7.0	Across fractured white quartzite with cerussite and limonite veinlets; moderate to heavy iron staining.	500	.3	72	23
458	do.	8.2	do.	300	.5	37	23
459	do.	4.0	do.	.1%	.7	27	17
460	do.	5.5	Across fractured brown quartzite and soil.	45	.1	24	18
461 4/	do.	8.0	do.	23	.1	24	20
462 2/	Grab	--	Dump sample from millsite of quartzite and dolomite with minor iron staining (1/4 mi west of fig. B-11).	NA	1.4	NA	NA
463	do.	--	Dump sample from millsite of white quartzite and soil (1/4 mi west of fig. B-11.	NA	1.6	NA	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
464	Grab	--	Dump sample from millsite of brown quartzite, dolomite, white quartzite, and soil (1/4 mi west of fig. B-11).	240	1.1	275	25
465 5/	do.	--	Dump sample of brown quartzite, brown dolomite, white quartzite, and soil; some rock also contain galena, malachite, azurite, chalcocite, and hematite.	149	2.92 oz/ton	322	.21 %
466 6/	Select	--	Of mineralized dump material of 465.	180	87.7 oz/ton	.2%	2.97%
467 7/	Grab	--	Of mineralized dump material, soil, and white quartzite containing copper minerals.	.26%	10.8 oz/ton	380	.12%
468	do.	--	Dump sample of soil, white quartzite and brown quartzite; some rock mineralized.	.12%	1.28 oz/ton	310	284
469	do.	--	do.	.45%	.60 oz/ton	488	156
470	Chip	0.5	Across fractured white quartzite with iron staining.	NA	.1	NA	NA
471	do.	10.0	do.	NA	.1	NA	NA
472	do.	10.5	do.	NA	.1	NA	NA
475	do.	.5	Across sheared green siltstone with minor iron staining.	NA	.1	NA	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
476	Chip	3.5	Across fractured white quartzite with chlorite and limonite.	26	0.5	16	30
477 8/	Select	--	Of stockpiles with white quartzite containing malachite, azurite, chalcopyrite, marcasite, brochantite, and hematite.	61	2.34 oz/ton	440	3.6%
478	Chip	.8	Across sheared white quartzite with bands of limonite and clay.	10	.1	36	54
479	do.	4.0	Across fractured and sheared interbeds of white quartzite, brown dolomite, and purple quartzite with some iron staining.	11	.5	20	100
480	do.	4.9	Across fractured white quartzite with minor iron and manganese staining.	4	.5	6	73
481	do.	.3	Across shear zone contact between purple quartzite, green siltstone, and white quartzite.	26	.1	27	63
482	Grab	--	Dump sample of brown quartzite and white quartzite; some rock containing copper minerals.	730	2.19 oz/ton	326	.16%
483 9/	Select	--	Of mineralized material of 482 containing chalcocite, malachite, brochantite, and azurite.	134	109.32 oz/ton	.14%	1.92%

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
484	Chip	11.0	Across fractured white quartzite with iron and manganese staining.	12	4.5	110	57
485	do.	4.1	Across sheared interbedded white and brown quartzite with disseminated copper minerals and hematite, and manganese staining.	.12%	1.23 oz/ton	610	.14%
486	Random chip	--	Across sheared brown quartzite with minor calcite and moderate manganese staining.	NA	1.0	NA	NA
487	Chip	1.5	Across sheared brown quartzite with veinlets and disseminated copper minerals and moderate iron and manganese staining.	.10%	3.9	205	.16%
488	do.	3.5	Across shear zone in brown quartzite with minor copper minerals, calcite, and some iron and manganese staining.	.38%	.20 oz/ton	410	260
489	do.	.6	Across shear zone in brown quartzite with iron and manganese staining.	.26%	.5	.13%	50
490	Select	--	Of gray dolomite with galena veinlets.	17.4%	.43 oz/ton	.11%	88
491	Chip	1.8	Across brown dolomite with galena veinlets.	445	2.1	170	52

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
492	Random chip	--	Of fractured brown quartzite.	0.12%	0.4	82	19
493	Chip	2.7	Across shear zone at contact between white quartzite and brown dolomite with limonite and manganese staining.	.10%	2.5	700	31
494 2/	do.	2.8	Across fractured and sheared white quartzite with iron and manganese staining.	2.77%	.21 oz/ton	.11%	51
495 1/	do.	2.3	Across sheared white quartzite with some limonite and manganese staining and clay gouge.	1.77%	.17 oz/ton	411	33
496	do.	3.8	Across fractured and sheared white quartzite with zones of limonite and manganese.	.18%	.9	242	14
497	do.	2.9	do.	390	.5	116	11
498	do.	3.5	Across fractured white quartzite between two shears with some limonite and minor manganese staining.	.56%	1.7	730	29
499	do.	3.9	Across fractured white quartzite with galena veinlets and moderate iron staining.	.15%	1.6	94	37
500	do.	1.2	Across sheared, altered brown dolomite with minor iron and manganese staining.	1.0%	.7	.43%	135

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
503	Grab	--	Dump sample of soil, quartzite, and dolomite.	0.4%	2.2	278	53
504	do.	--	Dump sample of soil, quartzite, and dolomite; some rock contains minor galena and copper minerals.	4.08%	.45 oz/ton	.27%	73
505	Chip	2.5	Across brown dolomite with iron staining.	850	.7	.6%	9
506	do.	2.2	Across sheared white quartzite with gouge and minor limonite and manganese staining.	6.75%	.79 oz/ton	.32%	110
507	do.	2.2	Across fractured white quartzite with galena blebs.	1%	.49 oz/ton	NA	NA
508	do.	1.5	Across sheared quartzite with gouge and iron staining.	780	.51 oz/ton	310	210
509	do.	2.3	Across fractured and sheared brown quartzite with clay gouge, limonite, and minor copper staining.	305	.61 oz/ton	422	390
510	do.	.4	Across gouge zone in quartzite.	.12%	1.31 oz/ton	.11%	315
511	do.	8.0	Across fractured brown quartzite with minor blebs of copper minerals.	126	.93 oz/ton	77	133
512	do.	3.5	Across fractured gray dolomite.	60	.27 oz/ton	268	80

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
513 10/	Chip	0.3	Across clay gouge zone.	190	2.16 oz/ton	640	980
514	do.	.1	do.	52	.15	256	89
515	do.	4.0	Across gray dolomite.	28	4.1	125	97
516	do.	2.5	Across purple quartzite.	160	1.14 oz/ton	.24%	.19%
517	do.	4.0	Across fractured brown quartzite with moderate to heavy limonite.	98	.27 oz/ton	105	145
518	do.	4.7	Across fractured brown quartzite with little iron staining and blebs.	100	.24 oz/ton	82	121
519 11/	do.	2.5	Across vein containing disseminated copper minerals with limonite, copper, and manganese staining.	76	>100 **	750	.84%
520	do.	3.8	Across sheared brown quartzite with blebs of manganese and copper minerals.	90	.22 oz/ton	100	133
521	do.	4.2	Across fractured quartzite with iron and manganese staining.	.73%	.18 oz/ton	620	26
522	do.	1.3	Across shear zone in quartzite with moderate iron staining and minor manganese.	210	.2	54	11
523 1/	do.	3.0	Across fractured white quartzite with iron-staining.	.57%	1.6	33	9

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
524	Chip	1.0	Across sheared and fractured brown quartzite with iron and manganese staining.	0.25%	1.7	0.36%	34
525	do.	2.2	Across shear zone in dolomite with limonite and manganese staining.	.10%	1.0	.12%	15
*526 2/	do.	3.3	Across shear zone in white quartzite and brown dolomite with white gouge and manganese dendrites.	200	.2	95	11
*527	do.	2.5	Across shear zone contact between white quartzite and brown dolomite with white clay gouge; limonite layers; minor manganese staining.	240	.3	192	9
528	do.	3.0	Across fractured and sheared white quartzite with minor manganese and chlorite.	138	.2	34	5
529	do.	1.2	Across shear zone contact between white quartzite and brown dolomite with minor iron and manganese staining.	NA	.1	NA	NA
*530	do.	1.6	Across shear zone contact between white quartzite and brown dolomite containing white clay gouge and minor iron and manganese.	NA	.2	NA	NA
531	do.	3.8	Across fractured white quartzite with minor iron staining.	210	.1	40	16

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
*532	Chip	4.4	Across shear zone in white quartzite with calcite, limonite, and manganese along fractures.	133	0.3	140	5
*533	do.	.8	do.	510	.4	264	10
*534	do.	2.8	Across fractured and sheared white quartzite with minor iron staining and gouge.	910	.2	29	8
*535	do.	1.5	do.	800	.3	450	9
*536	do.	2.5	do.	360	.5	193	25
*537	do.	3.0	Across fractured and sheared brown dolomite with iron and manganese staining.	520	1.6	660	43
*538	do.	2.4	Across sheared and fractured quartzite with gouge and minor limonite and manganese staining.	2.77%	.20 oz/ton	486	41
539	do.	1.7	do.	5.9%	.39 oz/ton	.21%	27
540	do.	2.5	do.	.7%	2.2	900	14
*541	do.	1.6	do.	.1%	.4	440	7
542	do.	1.2	Across sheared dolomite with clay gouge with galena veinlets.	2.13%	.21 oz/ton	.15%	41

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
543	Chip	8.5	Across sheared brown dolomite with gouge and iron and manganese staining.	0.25%	1.4	0.19%	16
544	do.	6.5	do.	.95%	3.0	.56%	16
*545	do.	2.5	do.	300	.4	165	11
546	do.	2.7	do.	85	.8	158	17
547	do.	5.0	do.	NA	.4	NA	NA
548	do.	5.2	Across fractured brown quartzite with iron and manganese staining.	NA	.5	NA	NA
549	do.	5.5	do.	80	.3	57	82
550	do.	7.0	Across fractured brown iron-stained quartzite.	NA	.2	NA	NA
551	do.	3.0	Across shear zone in brown quartzite with gouge and minor limonite.	30	.2	47	8
552	do.	.5	do.	.17%	4.9	282	83
553	do.	4.6	Across fractured calcareous brown quartzite with some iron and manganese staining.	NA	.5	NA	NA
554	do.	5.5	Across sheared and fractured white and purple quartzite with some iron and manganese staining.	NA	.5	NA	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
555	Chip	5.0	Across fractured brown quartzite.	60	0.1	66	7
556	do.	4.0	Across fractured brown quartzite with some manganese staining.	156	.9	118	21
557	do.	5.5	Across sheared and fractured quartzite with some clay gouge.	36	.2	102	7
558	do.	7.7	Across sheared and fractured brown quartzite with limonite staining.	NA	4.5	NA	NA
559	do.	4.0	Across brown quartzite with iron and manganese staining.	770	3.9	489	99
560	do.	2.8	Across sheared and brecciated quartzite with gouge and limonite.	430	1.2	200	39
561	do.	7.0	Across fractured white quartzite with iron and manganese staining.	85	.3	72	9
562	do.	2.3	do.	NA	1.8	NA	NA
563	do.	2.5	Across sheared quartzite with gouge.	0.33%	.23 oz/ton	.11%	176
564	do.	5.4	Across brown quartzite with iron staining and minor manganese staining.	NA	.7	NA	NA
565	do.	3.2	Across fractured white quartzite with iron and manganese staining and minor limonite blebs.	105	3.5	77	37

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
*566	Chip	2.4	Across shear zone in white quartzite at contact with brown dolomite contains gouge; iron and manganese staining.	0.68%	0.32 oz/ton	436	78
567	do.	1.8	Across fractured white quartzite.	660	.15 oz/ton	130	21
568	do.	2.3	Across dark gray dolomite.	.13%	1.26 oz/ton	730	35
*569	do.	1.5	Across shear zone in white quartzite at contact with brown dolomite with limonite.	.54%	>100 **	740	360
570	do.	1.4	Across fractured white quartzite with iron and manganese staining.	890	2.51 oz/ton	43	20
571	do.	7.0	Across fractured brown quartzite with iron and minor manganese staining.	NA	1.4	NA	NA
572	do.	3.1	Across light gray quartzite with iron and minor manganese staining.	27	.1	21	21
573	do.	6.9	Across interbedded fractured brown and purple quartzite with calcite veinlets.	NA	1.2	NA	NA
574	do.	5.8	Across fractured and sheared light gray dolomite with calcite veinlets and iron staining.	56	.1	NA	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
575	Chip	4.0	Across waterlogged fractured white and brown quartzite with some iron staining.	480	0.2	265	10
576	do.	7.8	Across fractured and sheared interbedded dolomite and white quartzite with calcite veins, gouge, and iron and manganese staining.	68	1.3	310	NA
577	do.	3.6	Across fractured white quartzite with some iron and manganese staining.	NA	.93 oz/ton	NA	NA
*578	do.	2.5	Across shear zone in white quartzite with limonite.	0.45%	43.9 oz/ton	650	520
579	Grab	--	Dump sample of brown iron-stained quartzite.	330	.8	130	18
580	do.	--	do.	1.68%	.15 oz/ton	.41%	19
581	do.	--	Dump sample of dolomite and quartzite	6.66%	.51 oz/ton	.8%	84
582	do.	--	do.	.1%	.2	160	8
583	do.	--	Dump sample of soil.	260	.5	315	11
584	Chip	3.5	Across fractured dolomite with galena and minor iron staining.	610	1.1	69	11

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
585	Chip	8.0	Across fractured white quartzite with minor iron staining.	168	0.3	37	20
586	do.	3.5	Across sheared and fractured brown and white quartzite.	32	.24 oz/ton	34	52
587	do.	3.4	Across fractured brown dolomite with limonite.	22	.2	34	51
588	do.	3.2	do.	NA	1.9	NA	NA
589	Grab	--	Dump sample of white iron-stained quartzite and soil.	240	.4	190	19
590	do.	--	do.	156	.1	58	52
598	Chip	2.1	Across sheared white quartzite at contact with dolomite; iron-stained.	0.11%	4.5	273	48
599	do.	4.5	Across fractured white quartzite with iron staining.	395	1.2	48	16
600	do.	4.0	Across fractured white quartzite with galena.	3.89%	.58 oz/ton	357	33
*601	do.	1.8	Across sheared white quartzite at contact with brown dolomite; contains gouge, limonite and manganese staining, and possible galena.	950	1.11 oz/ton	470	83
602	do.	7.0	Across fractured white quartzite with iron staining.	NA	.2	NA	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
603	Chip	6.0	Across fractured and sheared white quartzite with clay gouge, calcite, and minor iron staining.	NA	0.2	NA	NA
604 1/	Select	--	Of brown and white quartzite, some highly fractured and iron stained.	NA	.1	NA	NA
605	Grab	--	Of brown and white quartzite and brown dolomite, some highly iron and manganese stained.	NA	.54 oz/ton	NA	NA
606	Chip	2.3	Across shear zone in brown dolomite with gouge and iron staining.	NA	.4	NA	NA
607	do.	2.8	Across fractured iron-stained white quartzite.	110	.1	51	NA
608 12/	do.	7.0	Across two shear zones and fractured brown dolomite with disseminated galena; iron-stained.	3.86%	.20 oz/ton	.28%	39
609	Grab	--	Dump sample of soil, brown dolomite, and iron-stained white quartzite.	NA	.3	NA	NA
610	Chip	8.5	Across fractured brown dolomite with shear zone; shear contains copper minerals, specular hematite, calcite, and manganese dendrites.	205	.16 oz/ton	180	710
611	do.	2.8	Across sheared and fractured brown dolomite and brown quartzite with iron staining.	NA	.6	NA	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
617	Chip	6.0	Across sheared and fractured brown dolomite and brown quartzite, and white quartzite; iron and manganese staining.	0.27%	1.6	291	17
618	do.	7.0	Across massive purple dolomite and purple quartzite with veinlets of galena.	2.09%	.41 oz/ton	3.15%	850
619	do.	2.2	Across fractured white quartzite with veinlets of galena; some iron and copper staining.	6.03%	14.0 oz/ton	.26%	890
620	do.	4.1	Across purple dolomite with galena veinlets and hematite blebs; highly iron-stained with some manganese blebs.	1.71%	2.31 oz/ton	.27%	216
621	do.	6.5	Across white quartzite with galena and chrysocolla along fractures; with limonite, manganese, and hematite staining.	1.21%	12.0 oz/ton	780	.12%
622	do.	2.3	Across white quartzite with inclusions of purple dolomite and galena veinlets; lightly iron- and manganese-stained.	3.23%	2.48 oz/ton	950	112
623	do.	2.0	Across white quartzite with veinlets of galena and chrysocolla; some iron staining and hematite blebs.	5.98%	44.9 oz/ton	.75%	.24%
624 4/	do.	3.1	Across white iron-stained quartzite with galena veinlets.	2.3%	1.08 oz/ton	NA	NA

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
625 2/	Chip	4.9	Across white iron-stained quartzite with galena veinlets.	1.78%	0.20 oz/ton	281	21
626	do.	3.7	Across white iron-stained quartzite with galena veinlets and malachite.	1.9%	13.6 oz/ton	400	.11%
627	do.	3.9	Across white iron-stained quartzite with galena and minor malachite.	.41%	2.48 oz/ton	590	510
628	do.	4.0	do.	.38%	2.54 oz/ton	490	234
629	do.	2.0	Across fractured purple to brown dolomite with calcite and malachite.	.34%	2.31 oz/ton	.34%	478
*630	do.	3.3	Across fractured brown quartzite.	56	.8	41	14
631	do.	1.4	Across shear zone in purple to brown dolomite with iron and copper staining.	.31%	1.78 oz/ton	.24%	.12%
*632 13/	do.	2.8	Across two shear zones in fractured brown dolomite and quartzite with cerussite, smithsonite, clay, and iron staining.	3.36%	.18 oz/ton	.7%	60
*633 14/	do.	3.5	Across altered brown dolomite and quartzite with cerussite veinlets, smithsonite, calcite, and iron staining.	6.03%	.48 oz/ton	.96%	126

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
*634	Chip	3.5	Across altered brown dolomite and quartzite between two shears containing cerussite, smithsonite, and calcite.	2.06%	0.25 oz/ton	0.93%	57
*635	do.	3.4	Across sheared and fractured brown quartzite with cerussite, smithsonite, and iron and copper staining.	.79%	3.4	.26%	22
*636	do.	3.7	Across shear zone in brown quartzite with clay gouge and cerussite.	1.39%	3.7	.15%	12
*637	do.	4.0	Across fractured brown quartzite and dolomite with calcite and iron staining.	275	.1	265	7
*638	do.	4.5	Across fractured brown quartzite and dolomite between two shears; contains veinlets of cerussite and iron and manganese staining.	2.03%	.15 oz/ton	.75%	21
*639 15/	do.	3.0	Across fractured brown dolomite and quartzite with cerussite and smithsonite.	850	.4	.41%	6
*640	do.	.7	Across sheared dolomite with calcite veinlets.	.24%	.25 oz/ton	.14%	118
*641	do.	2.1	Across fractured brown quartzite and dolomite with calcite veinlets and light iron staining.	70	.1	150	9

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
*642 16/	Chip	6.8	Across fractured brown quartzite and dolomite with cerussite, smithsonite, and iron staining.	12.0%	0.39 oz/ton	0.55%	25
643	do.	4.3	Across fractured gray dolomite with calcite stringers and limonite blebs.	NA	.9	NA	NA
644	do.	5.2	Across sheared white and brown quartzite with limonite staining and banding.	NA	1.4	NA	NA
645	do.	7.0	Across two shear zones in fractured brown quartzite with minor copper and possible cerussite.	405	.1	68	33
646	do.	5.6	Across massive fractured brown dolomite and quartzite.	260	.1	400	9
647	do.	4.0	Across fractured, iron-stained quartzite.	160	1.0	286	35
648	do.	5.0	Across sheared and fractured brown quartzite with veinlets of possible galena.	212	.1	330	10
649	do.	9.0	do.	600	.3	453	17
650	do.	2.0	Across shear zone in brown fractured quartzite; iron-stained.	94	.1	210	7
652	do.	4.1	Across fractured brown quartzite with pyrite blebs and iron staining.	33	.1	52	7

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
*653	Chip.	6.0	Across two shear zones in fractured brown dolomite with veinlets of galena cerussite, calcite, and iron staining.	4.40%	0.30 oz/ton	0.81%	146
654	do.	13.5	Across sheared brown dolomite and quartzite with veinlets of galena.	2.10%	2.9	.28%	26
655	do.	3.1	Across sheared and fractured brown quartzite and dolomite with disseminated galena.	4.68%	1.64 oz/ton	1.39%	100
*656	do.	8.0	Across brown and white quartzite with blebs and veinlets of galena.	6.58%	1.58 oz/ton	1.0%	240
*657	do.	7.0	Across fractured brown dolomite between two shears with galena, cerussite, and smithsonite; heavily iron-stained and calcite coated.	15.8%	.88 oz/ton	1.17%	115
658	do.	2.5	Across fractured purple dolomite and gray quartzite between two shears with iron staining.	.15%	3.0	260	13
*659	do.	6.5	Across fractured iron-stained brown dolomite with shear zone containing galena, cerussite, and smithsonite.	3.36%	.15 oz/ton	.94%	27
*660	do.	6.0	Across fractured brown dolomite between two shears with calcite veinlets; iron-stained.	1.3%	1.7	.95%	10

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
*661	Chip	3.9	Across fractured purple brown dolomite between two shears with veinlets of galena and cerussite; iron-stained.	3.74%	0.20 oz/ton	1.06%	26
662	do.	8.0	Across sheared and fractured purple dolomite with disseminated cerussite, calcite veinlets, and iron and manganese staining.	0.57%	1.1	.38%	9
691	do.	2.0	Across gouge zone in white quartzite at contact between white quartzite and brown dolomite with blebs of cerussite; iron-stained.	.32%	.54 oz/ton	580	37
692	do.	3.0	Across gouge zone in brown quartzite at contact between white quartzite and brown dolomite.	.78%	.70 oz/ton	.16%	173
693	do.	1.6	Across shear zone contact between brown quartzite and dolomite; contains gouge and is highly iron-stained.	900	.18 oz/ton	NA	NA
694	do.	4.8	Across sheared and fractured brown quartzite and dolomite between two shears; light iron and manganese stain.	600	1.4	NA	NA
695 17/	do.	2.9	Across two shears in fractured brown dolomite with cerussite and smithsonite; contains limonite blebs and manganese staining.	.79%	.34 oz/ton	.32%	108

TABLE B-6.--Sample data and descriptions for the Great Western mine--Continued

Sample				Analyses			
No.	Type	Length (ft)	Description	Lead	Silver	Zinc	Copper
696	Chip	6.0	Across fractured brown and grey dolomite with blebs of galena and smithsonite.	730	1.2	500	18
826	do.	6.5	Across sheared white quartzite with zones of iron staining and gouge; some manganese staining.	155	.1	112	3
827	do.	5.8	do.	133	1.8	119	4
828	do.	7.3	do.	98	.6	122	4
829	do.	5.1	do.	.21%	1.9	310	16
830	do.	2.8	do.	238	.1	152	7

** Not analyzed for ore grade
1/ Also contains 10 ppb Au
2/ Also contains 5 ppb Au
3/ Also contains 22 ppm Sb
4/ Also contains 15 ppb Au
5/ Also contains 14.2 ppm Sb
6/ Also contains 130 ppm Sb
7/ Also contains 11 ppm Sb
8/ Also contains 0.6% As, 58 ppm Sb
9/ Also contains 0.2% As, 100 ppm Sb
9/ Also contains 0.2% As, 100 ppm Sb
10/ Also contains 20 ppb Au
11/ Also contains 425 ppm As, 39 ppm Sb
13/ Also contains 5 ppm As, 4.8 ppm Sb
14/ Also contains 11 ppm As, 5.4 ppm Sb
15/ Also contains 24 ppm As, 12 ppm Sb
16/ Also contains 1 ppm As, 0.2 ppm Sb
17/ Also contains 2 ppm As, 4.8 ppm Sb
17/ Also contains 48 ppm As, 6.2 ppm Sb, 6 ppm Mo

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area

[*, outside the study area; underlined, properties that warrant additional investigation for resources; see appendices D and E for complete listing of sample analyses]

Map no.	Name	Summary	Workings and production	Resource and sample data
01	Hahn prospect	Workings are in the White Knob Group. The vein in the adit strikes N. 68 to 75° W. and dips 45° SW. in beds of argillaceous, fetid, dolomite which strike N. 5 to 15° W. and dip 5 to 15° SW. The vein is 2.9 to 3.2 ft thick, is exposed for about 40 ft along strike, and is mainly breccia with calcite, limonite, malachite, and sphalerite.	One 25-ft-long adit, one 8-ft shaft, one caved shaft.	Two chip and two grab samples were collected. The chip samples of vein material from the adit contained 0.14% and 172 ppm lead, and 540 ppm and 100 ppm zinc. The grab samples had as much as 78 ppm lead and 112 ppm zinc. The vein is an occurrence too small and low grade to be classified a resource. It does not extend into the study area.
02	Hope Nos. 1-3 prospect*	Two veins in dolomite of the Saturday Mountain Formation strike N. 40° E. and dip 70 to 75° NW. parallel to bedding. The upper vein at the 70° inclined shaft could be traced by float for about 60 ft, is as thick as 3 ft, and extends down dip at least 34 ft. The vein pinches out on the south end and is faulted off at the north end. It consists of quartz with iron oxides, galena, chalcopyrite and secondary copper minerals. The lower vein could be traced for about 50 ft, is as much as 2 ft thick, and consists mostly of limonite and goethite with some remnant galena.	One 34-ft inaccessible inclined shaft and one pit on the upper vein; one cut on the lower vein. No production.	Three grab samples of vein material contained from 120 to 600 ppm lead, 500 to 540 ppm zinc, 0.6 to 2.4 ppm silver, and 320 ppm to 1.60% copper. Two contained 25 and 85 ppb gold. No resources were calculated because of low metal values, and the limited extent of the veins. The veins are unusual for the Trail Peak area because they are copper-silver veins. They do not extend into the study area.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
03	Red Warrior mine* (Sunrise Nos. 1-3) (see figs. D-1 and D-2)	The workings are situated in or at the contact of the Jefferson Dolomite and the Saturday Mountain Formation. The area is in a zone of numerous north-trending faults with the Trail Peak Thrust Fault cutting between the upper and lower workings. Very few outcrops are exposed in either area. Underground workings at the upper group contain north to southeast trending undulating shears with dips from 49° W. to 70 to 76° E. The shears had widths as much 1.3 ft and consisted of brecciated dolomite shot through with calcite and limonite stringers. Stockpiles contained baked limonite, vuggy dolomite, decomposed sulfides, quartz and calcite stringers, malachite blebs and stains, sphalerite and galena. Similar geology and mineralized zones occur at the Iron Mask and Excelsior mines.	The workings are divided into two areas, upper and lower. The upper area consists of one adit caved at 50 ft, one 90-ft inclined shaft, and five pits. The lower area consists of one caved adit, one caved shaft, one pit, one open cut, three trenches, and one open pit, 100 by 60 ft. From 1910 to 1941, a total of 155 tons of ore was produced ranging from 4 to 18 oz/ton silver and 11 to 58% lead, with minor amounts of copper, zinc, and gold (USBM production files).	A total of 20 samples were taken (seven chip, nine select, and four grab). All samples contained lead, zinc, copper, and silver, and all but six contained gold. Ten select samples of mineralized sheared dolomite contained from 230 ppm to 20.5% lead; 135 ppm to 26.8% zinc; 1.8 ppm to 70.9 oz/ton silver; and <5 ppb to 0.11 oz/ton gold. Three chip samples of shear zone material contained 6 ppm to 0.7% lead; 43 ppm to >1.0% zinc; and 0.1 ppm to 1.2 oz/ton silver. One chip sample of highly mineralized shear material contained 28.9% lead, 7.04% zinc, 14.5 oz/ton silver, and 0.03 oz/ton gold. Six select and grab samples contained gold in the range of 0.02 to 0.15 oz/ton. The assays represent a minable grade. Workings were insufficiently exposed to do a detailed resource evaluation. A detailed drilling and exploration program needs to be initiated to better define the extremely intense faulting in the area and how mineralized areas relate both laterally and at depth. Structures and mineralized zones do appear to trend into the study area.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
04	Iron Mask mine* (Valley View) (see figs. D-3 to D-7)	The workings are in a complexly faulted area just north of Trail Peak, in the cirque wall of Horsehoe Gulch. The lower Iron Mask tunnel is in dolomite of the Silurian Laketown Formation; the upper Valley View tunnel is in dolomite of the Ordovician Saturday Mountain Formation. Dolomite of the Devonian Jefferson Formation is also found in the area. An intrusive granitic stock lies about 3/4 mi north of the mine. Faults, shears, and bedding planes are filled with veins and replacement bodies containing lead, zinc, and silver with minor copper and trace gold. They strike N. 10 to 35° E. and dip 25 to 90° SE. Veins and fault breccia zones range from 0.75 to 4.5 ft thick. Veins and replacement bodies have been extensively leached and oxidized, and are now composed of limonite, goethite, cerussite, and other secondary lead, zinc, and iron minerals. Siliceous boxworks and pseudomorphs of galena and sphalerite are also found in the oxidized veins. A few veins consist of brown, greasy-lustered, brecciated quartz with galena, limonite, and malachite. No wallrock alteration was observed, but assays indicate the wallrock does contain anomalous metal values. Brecciated dolomite and gouge are common in the fault and shear zones. An occurrence of vanadinite was reported from a small prospect near the Iron Mask mine (Stearns, 1923, p. 127).	One inclined shaft and eight adits totaling over 700 ft, 10 caved adits, and numerous pits and trenches. The now caved Iron Mask tunnel was 650 ft long (Kiilsgaard, 1951). Remains of several trams that connected the upper workings to Horseshoe Gulch were also found. Unrecorded amounts of high-grade lead ore were produced prior to 1901. Between 1908 and 1926, over 500 tons of ore containing from 12 to 40% lead and 2 to 40 oz/ton silver with minor amounts of copper and trace gold were produced (USBM production files). Six tons of ore were produced in 1937, and 38 tons containing 19% lead in 1948 (Kiilsgaard, 1951).	Thirty-nine samples were collected, including 30 chip and 9 select. Chip samples of vein and replacement material ranged from 0.01 to 12.5% lead, 0.003 to 2.6 oz/ton silver, 0.026 to 11.1% zinc, 9 ppm to 0.52% copper, and <5 ppb to 260 ppb gold. Select samples of high-grade vein material contained from 3.57 to 15.7% lead, 0.6 to 2.86 oz/ton silver, 0.70 to 8.52% zinc, 0.07 to 4.73% copper, and 50 ppb to 0.018 oz/ton gold. Because of lack of underground exposure of the veins, discontinuity of veins, and lack of extension into the study area, resources were not calculated. Minable grades, past production, and the presence of a zone of oxidation suggest resources may be present at depth. Faulting as mapped by Rupel and Lopez (1981) and Hait (1965) may cut off extensions into the study area south of the mine. However, similar deposits exist at the Excelsior mine to the east; similar geology does exist in the study area. Additional work would be necessary to determine the size, grade, extent of the existing deposit, and if any extensions occur within the study area.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
06	Dividend mine* (Big Smokey and others; Tara Lyn; Warm Creek Silver) (see figs. D-8 and D-9)	The workings are in a complexly faulted area just east of the Trail Peak Thrust Fault on Spring Mountain. One 280-ft adit explores a shear zone with quartz vein in the crosscut. It strikes N. 5 to 10° W., dips 62 to 75° SW., ranges from 0.5 to 4.0 ft wide, and is exposed for 165 ft. The 100-ft adit is in a fault zone containing several N. 60 to 70° E. shears that dip vertically, are 2.0 to 8.0 ft wide, and are exposed along strike up to 50 ft. Another shear zone strikes N. 20° W., dips 40 to 90° NE., ranges from 3 to 4 ft wide and is exposed for 15 ft. The shears contain pockets and stringers of sulfide minerals in quartz and silicified dolomite that have been brecciated. The host rock is Jefferson dolomite that has been intruded by andesite dikes and quartz veins, and silicified.	Two adits, one 280 ft with 200 ft crosscut and the other 100 ft. Two caved adits, one was 100 ft. One caved shaft. Ten small pits or trenches. In 1929 and 1937, a small amount of ore was produced with as much as 65% lead and over 200 oz/ton silver (USBM production files).	Eleven chip and four grab samples were collected. Six chip samples of sheared dolomite from the 280-ft adit contained from 12 to 156 ppm lead, 177 to 390 ppm zinc, and 0.1 to 0.7 ppm silver. Four chip samples of sheared dolomite from the 100-ft adit contained from 26 to 490 ppm lead, 100 ppm to 0.18% zinc, and 0.1 to 4.5 ppm silver; one grab of stope material contained 0.36 oz/ton silver and 240 ppb gold. One chip sample of brecciated dolomite from a pit contained 1.39% lead, 0.53 oz/ton silver, 0.30% zinc, and 0.38% copper. Three grab samples collected in 1965 by Hilpert contained from 0.3 to 8.4% lead, 2.3 to 17.7 oz/ton silver, 0.13 to 0.48% copper, and trace to 0.03 oz/ton gold. Because of the spotty nature of the mineralized zones and low grade of the deposit, no resources were calculated. The property lies 1/2 mi west of the study area boundary. Similar deposits have been mined in the Spring Mountain mining district, but they could not be traced into the study area on the Challis National Forest side. Similar deposits occur at the Excelsior mine in the Targhee National Forest. Further investigation is recommended to determine the extent of the mineral deposit and relationship to other mines and prospects in the area.
07	Davis Canyon prospect	The workings are in the White Knob Group. Limonitic jasperoid is along a breccia zone that parallels quartzite bedding. The zone strikes N. 15° W., dips 15° SW., is 2.3 to 15 ft thick, and can be inferred for about 150 ft. Similar occurrences are at the Mammoth Canyon prospects.	One trench and one pit.	Two chip samples of jasperoid in the breccia zone contained 32 and 35 ppm lead and 40 and 48 ppm zinc. These values are two to three times above average crustal abundance. No mineral resources are identified. Further study in conjunction with the Mammoth Canyon prospects may be warranted to determine the significance of these occurrences.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
08	Warm Creek prospect*	A 2.0-ft-thick fault zone strikes N. 85° E. and dips 60° NW. in argillite of the Precambrian Swauger Formation. Fractures and shears are heavily iron-stained.	One pit.	Three chip samples of the fault zone contained 14 to 700 ppm zinc. No further study is recommended.
09	Lost Cabin prospect	The working in the Milligen Formation exposes iron-stained limestone. No mineralized structures were found.	One prospect pit.	Two samples were collected, a chip sample to determine metals concentrations, and a random chip to determine the purity of the limestone. The chip sample contained no anomalous values. The random sample contained 3.47% SiO_2, 0.51% Al_2O_3, 0.26% Fe_2O_3, 1.09% MgO, and 50.05% CaO. No metals resources were identified. No further work is recommended.
10	Mammoth Canyon prospect No. 2	Country rock in the area consists of limestone from the White Knob Group. The limestone is brecciated and contains numerous calcite veins up to 3.0 ft wide. The largest of the veins strikes N. 3° W. with a dip of 58° SW. and is exposed over a length of 35 ft. Both limestone and calcite are heavily iron-stained.	One 35- by 5-ft trench.	One chip of the calcite, one random chip of outcrop of brecciated limestone, and one select of brecciated limestone and calcite contained 92, 33, and 36 ppm zinc, but were depleted in lead. No further work is recommended.
11	Mammoth Canyon prospect No. 1	Workings explore limestone from the White Knob Group. The fossiliferous limestone is brecciated with pods of leached, vuggy limonite. Some of the limonite pods are jasperoidal. The limestone has also been recrystallized with calcite stringers throughout, and is highly iron stained.	Two pits, 3 by 3 ft.	Two select samples of limonitic pods from the pits and two select samples of outcrops west of the pits were collected. They contained 18 to 430 ppm zinc. Similar occurrences are found at Mammoth Canyon prospect No. 3, and at the BC claims in Black Canyon. No further work is recommended.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
12	Mammoth Canyon prospect No. 3	Working explores a zone of iron replacement of the Jefferson Formation. Country rock consists of brecciated fossil-bearing limestone with stringers of calcite. Trend of the highly contorted limestone is N. 25° W. Pods of limonite/hematite occur throughout. Situated west of the divide is the Trail Peak Thrust Fault trending in a northerly direction; the replacement zone is roughly perpendicular to the fault. The zone consists of jasperoid completely replaced in part by hematite with some remnant marcasite/pyrite. The replacement occurs over a length of about 500 ft and a width of 40 ft. Trend of the zone is NW. with a dip of roughly 65° SE.	One open pit 500 by 40 ft.	One grab and one select of the replacement zone; and one grab and one select of the limestone were collected. Zone samples contained trace lead and zinc, and 36% iron. Limestone contained anomalous lead, zinc, and 1.2% iron. The replacement zone appears to be localized and situated high on the crest of the range. Access is extremely difficult and assay values are not of a minable grade. Similar mineral occurrences can be found at the BC claims in Black Canyon. No further work is recommended.
13	Copper Bluff mine (Bornite, Bell Mountain, Mountain Bill) (see fig. D-10)	Workings are in dolomite of the Saturday Mountain Formation, on either side of the Trail Peak Thrust Fault and near the contact with the Kinnikinic Quartzite. Dolomite and quartzite are complexly folded and sheared. The northwest-trending Trail Peak Fault is offset by northeast-trending normal faults; and slivers of the Kinnikinic and Precambrian phyllite occur in the area. The caved inclined shaft at the lower workings explores a northeast-trending shear zone at the contact between limestone and quartzite. High-grade dump material contained vein quartz with chalcocite, malachite, chrysocolla, and azurite. Umpleby (1917, p. 113) states the vein is as much as 1.5 ft thick. At the upper workings, two northeast-trending shear zones contain iron-oxide and copper minerals. The shears could not be traced beyond the workings. Secondary copper minerals were also observed in fractures in dolomite.	One adit totaling 135 ft, one inclined shaft totaling 36 ft, three caved adits, one caved inclined shaft, five pits. USBM production files report almost 20 tons of ore were produced between 1932 and 1941 containing as much as 20% copper and 15 oz/ton silver; in 1951, 1 ton of ore containing copper, lead, and silver was shipped.	Twenty-three samples were collected including nine chip, eight select, four grab, and two random chip. One chip of mineralized shear zone material from the lower workings contained 0.72% copper, 0.18 oz/ton silver, and 174 ppm lead; one high-grade select contained 5.08% copper, 0.61 oz/ton silver, and 600 ppm lead. Five chip samples of mineralized shear zone material from the upper main workings contained 0.10 to 7.98% copper; one chip sample contained 0.12 oz/ton silver; and two select samples contained 16.3 and 20.8% copper, 0.28 and 0.23 oz/ton silver; 465 and 187 ppm lead, and 460 and 400 ppm zinc. Further work is recommended to determine if additional resources occur at depth. A similar occurrence is found in Spring Mountain Canyon at the Hope prospect.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
14	Argalite prospect	A prospect pit occurs in Quaternary landslide deposits from Bell Mountain.	One prospect pit.	A grab sample from the dump contained 27 ppm lead, 41 ppm zinc, and 10 ppb gold. No further work is recommended.
15	Magpie Springs prospect	Workings are in Precambrian shales, probably the Summerhouse Formation. A shear zone is 1.8 to 3.5 ft thick, strikes N. 10° W., dips 50° NE., and is traceable for about 50 ft along strike and 20 ft along dip. The shear zone contains secondary copper and iron-oxide minerals, and calcite.	One 65-ft-long adit and one 25-ft-long trench.	Two chip samples of shear zone material were collected. They contained 0.35 and 0.70% copper. One sample contained 10 ppb gold. A similar occurrence is found in Precambrian units near the mouth of Uncle Ike Creek.
16	Copper Bell prospect	The claims are in the upper plate of the Bell Mountain Thrust Fault. Samples are from sheared and brecciated zones containing hematite and limonite in the Kinnikinic Quartzite and dolomite of the Saturday Mountain Formation.	Claim locations.	Two grab and one random chip samples were collected. One sample of brecciated quartzite contained 0.075% lead and 0.043% zinc. All the samples contained two to several times the average crustal values of lead, zinc, and copper for quartzite. Anomalous metal values are characteristic of these same formations at other workings in the study area.
17	Silver Bell prospect	Workings are at the thrust fault contact between the Three Forks dolomite and the Milligen Formation. The 300-ft-wide fault zone trends N. 60 to 70° E. and dips 80° SE.; bedding trends northwest and dips northeast. Replacement lenses are found along fractures that both crosscut and follow the bedding. The lenses contain calcite, siderite, and iron-oxide minerals.	Three trenches.	Two chip and two random chip samples of lens material were collected. Values only slightly elevated from crustal abundance values were detected for copper, lead, and zinc.
18	VJ* (Red Rock)	Workings are in the Tertiary Edie School Rhyolite. The rhyolite is purple-gray and porphyritic in places, and weathers in tabular pieces.	Eight bulldozer cuts.	One chip and four grab samples of rhyolite were only assayed for gold and silver; neither were detected. The rhyolite may be suitable for decorative stone. The rhyolite does not extend into the study area.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
19	Bell View mine*	Hematite/magnetite replacement bodies containing manganese occur in bedding planes and related shears in dolomite of the Saturday Mountain Formation. The open pit exposes two main pods trending N. 35 to 70° W. and dipping 75° SW. One is 120 ft by 25 ft and the other is 45 ft by 15 ft. Assuming about 10 ft is exposed, there are about 6,000 tons of material in place. About 3,500 tons of material are on the dump. Another several hundred tons are stockpiled 1 mi southwest. A small pod of iron and manganese occurs in the trench southwest of the main pit. A magnetic survey by the BLM and surface examination do not show these pods as continuous. The magnetic survey did indicate a maximum depth of 60 to 136 ft for the anomaly at the open pit.	One open pit and three trenches. Claimants report production of about 7,000 tons of 60% iron and 400 tons of manganese since 1963 (BLM patent application I-18847).	Twelve samples of hematite replacement bodies were collected. Seven were evaluated by whole rock analysis for iron content. They contained from 1.8 to 37% total iron, and from 2.99 to 47.85% hematite. Two samples contained 40.3 and 47.4% manganese oxide. No anomalous precious metal values were found. USBM estimated about 6,000 tons of subeconomic resources are in place in the exposed iron replacement bodies, about 3,500 tons of iron are on the dump, and another several hundred tons are stockpiled at the millsite in sec. 14. The resources are based on two pods measuring 140 ft by 40 ft by 4 ft and 120 ft by 25 ft by 10 ft. A tonnage factor of 6 ft^3/t was used. U.S. Steel Corporation estimated 7,500 tons of indicated and 10,000 tons of inferred resources (BLM patent application I-18847). The iron replacement bodies are not extensive enough to compete with existing sources. Additional work is required to determine if additional deposits exist.
20	Iron Cap prospect	A hematite/magnetite replacement body occurs along a bedding plane shear in the Saturday Mountain Formation dolomite. The iron nodule or lens is 3 ft by 6 ft, and is in a shear which strikes due north and dips 30° E. Workings explore the area just east of the Bell Mountain Thrust Fault contact between the Jefferson and Saturday Mountain Formations with a sliver of Kinnikinic Quartzite at the fault contact.	Five trenches and two pits. No production.	Three samples were collected. One chip sample of the iron nodule contained about 62% iron, 0.006% chromium, and 0.006 oz/ton silver. Two grab samples of dolomite contained no anomalous metal values. The iron replacement could not be traced beyond the workings, and is therefore considered an isolated occurrence. This occurrence is similar to the Bell View deposit 1 mi to the northwest. Further work is needed to determine if additional resources extend between the two properties.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
21	Bighorn Canyon prospects*	Workings are in the Tertiary Edie School Rhyolite. Purple porphyritic rhyolite weathers into tabular slabs. Outcrops of the rhyolite occur within the study area in secs. 20, 29, and 30, T. 10 N., R. 29 E. (Beutner, 1968, pl. 1).	Three trenches.	Two grab samples of rhyolite were assayed for gold and silver; neither was detected. The rhyolite may be suitable for decorative stone. The rhyolite outcrops in the study area were not examined.
22	Log Chain prospect	The workings are in an erosional remnant of Saturday Mountain Formation dolomite lying on Kinnikinic Quartzite. The remnant trends N. 70° W., is 2,000 ft long, and 800 ft wide. The upper trench exposes a zone of brecciated dolomite whose matrix is replaced by earthy red hematite that extends about 100 ft along strike. The lower trench is in red hematitic soil washed down from the upper trench and does not expose bedrock.	Two trenches about 600 ft apart.	One grab sample of brecciated dolomite contained 0.6 ppm silver and 52 ppm zinc. These values are about twice the average crustal values for limestone. No further work is recommended.
23	Williams Creek prospect	A trench is in highly jointed and sheared Jefferson dolomite on the limb of a syncline in the upper plate of a small thrust fault. No mineralized structures were observed. An outcrop of sheared and brecciated Kinnikinic Quartzite about 1/2 mi southwest of the trench was sampled. It is near the contact with the Saturday Mountain Formation in the upper plate of the thrust fault.	Shallow trench.	One grab sample of dolomite from the dump contained 30 ppm zinc. A random chip of quartzite contained 310 ppm lead, 0.4 ppm silver, and 30 ppm zinc. Sampling indicates there are anomalous metal values in the quartzite similar to other prospects in the Kinnikinic Quartzite. Because of lack of widespread mineralized zones and indefinite structures, no further work is recommended.
24	Middle Fork Pass Creek prospect	A small pit is in Tertiary basalt.	One pit.	One grab sample of iron-stained basalt contained no anomalous metal values. No further study is recommended.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
25	Bald Mountain Gulch prospect*	A trench is in unnamed Carboniferous limestone. No mineralized structures are exposed. The limestone is iron stained and contains calcite veinlets.	One shallow trench.	One grab sample of limestone contained 125 ppm lead. No further study is recommended.
26	Automatic mine* (see fig. D-11)	A limonite vein is found in the shear zone contact between the Kinnikinic Quartzite and the Saturday Mountain Formation. The vein strikes from N. 35 to 50° E., and dips from 54 to 67° NW.; it pinches and swells for about 240 ft along strike and ranges from 0.2 to 3 ft thick. Copper minerals observed include azurite, chrysocolla, and malachite. There is minor lead, zinc, and silver disseminated throughout the fault zone. The main structure pinches out within the length of the adit. To the north and south the structure would be offset by faults if it were continuous.	One 450-ft adit; one caved adit; one 20-ft shaft; one caved shaft and one trench. In 1907, 1916, and 1917, about 150 tons of ore with an average grade of 12% copper were produced.	One grab, one select, and nine chip samples were collected. The chip samples of shear zone and vein material contained from 0.27 to 6.89% copper, 0.027 to 1.0% lead, 0.12 to 0.18% zinc, and 0.05 to 0.34 oz/ton silver. One select sample from the dump contained 1.1% copper, 0.067% lead, 0.036% zinc, and 0.12 oz/ton silver. About 2,400 tons of vein material with an average width of 1.4 ft containing 3% copper, 0.24 oz/ton silver, 0.13% lead, and 0.19% zinc are present. Further study is recommended to determine if additional mineralized zones exist at depth.
27	Lucky Strike prospect* (see fig. D-12)	The area is just east of the Horse Creek detachment fault, in the lower plate, near the contact between the Saturday Mountain Formation and the Kinnikinic Quartzite. A northerly trending anticline lies between the Lucky Strike and the Automatic mine. At the main workings, a nearly flat-lying vein of fine-grained steely gray and earthy red hematite about 2 to 3 ft thick is hosted by massive gray dolomite of the Saturday Mountain Formation. Exposures are too poor to determine the areal extent of the vein. A trench 1/4 mi east of the main workings is in the Kinnikinic Quartzite which is highly fractured and filled with iron-oxide minerals.	Twelve pits, cuts, and trenches; one shallow shaft; and one 5-ft adit. No production.	Six samples of hematite vein material contained 19.91 to 75.95% Fe_2O_3. One sample of altered dolomite and two samples of quartzite contained anomalous lead, zinc, and copper. Further study is recommended to determine the nature and extent of anomalous metal values and any relation to occurrences at the Automatic mine, 1/2 mi to the east.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
28	Jersey Belle prospect (Merrill)*	The workings are situated in the Saturday Mountain Formation. The area consists of an iron-stained brecciated dolomite shot through with calcite stringers. Strike of the dolomite is N. 38° E. with a dip of 37° SE. In the adit, shears in dolomite strike N. 37° E. with dips of 31 to 82° SE. Shears are primarily brecciated dolomite with limonite along fractures. An iron-oxide lens with calcite veinlets also occurs in the adit over an area of 6 by 40 ft, and trends N. 40° E. and dips 38° SE.	One 132-ft adit, three caved adits, and three trenches.	Seven chip samples and two select samples were taken. Three chip samples of oxidized lens material from the 132-ft adit contained 105 to 378 ppm lead, 78 to 295 ppm zinc, 0.6 to 2.6 ppm silver, and 51 ppm to 0.13% copper. Four chips of sheared dolomite from the adit contained 22 to 74 ppm lead, 29 to 164 ppm zinc, 0.3 to 0.7 ppm silver, and 19 to 92 ppm copper. Although metal assays here are low and not minable, mineral occurrences are similar to those at the Badger mine to the south, the Automatic to the northwest, and the Lucky Strike to the west. Further exploration is needed to delineate structure and mineralized zones, both laterally and at depth.
29	Hope prospect (see fig. D-13)	Working explores limestone of the White Knob Group in the Horse Creek glide block west of the Horse Creek detachment fault. Limestone is iron stained and contains leached veinlets of limonite.	One caved adit.	Two chip and one select sample were taken. One chip sample of iron-stained limestone contained 0.11% lead and 0.03 oz/ton silver; anomalous amounts of lead and zinc were detected in the other samples. Similar occurrences are found at the Westside, Bar No. 2, Badger Creek, and Ore House No. 32B prospects. Further exploration would be necessary to determine the significance of anomalous metal values in the White Knob Formation.
30	Westside prospect (see fig. D-13)	Workings explore the Horse Creek Thrust Fault contact between the White Knob Group and the Kinnikinic Quartzite. Country rock on the west side of the fault consists of iron-stained limestone; on the east side of the fault is white fractured quartzite, heavily iron stained. At the contact, an approximately 5-ft-thick shear zone trending N. 20° E. contains limonite, brecciated limestone, and fragments of white quartzite.	Two pits, averaging 10 ft in diameter.	One select and two random chip samples were taken. A random chip of the shear zone contained 90 ppm lead and 0.47% zinc. The random chip of iron-stained quartzite contained 128 ppm lead and 0.16 oz/ton silver. Both contained 30 and 20 ppb gold, respectively. The select sample of limestone contained 374 ppm zinc. Similar occurrences are found at the Hope, Bar No. 2, Badger King, and Ore House No. 32B prospects. Further study would be necessary to determine the significance of anomalous metal values in the White Knob Group.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
31	Badger King mine (see fig. D-13)	Workings explore an area of about 1,000 ft by 2,600 ft which includes the White Knob Group, Kinnikinic Quartzite, and Saturday Mountain Formation. The Kinnikinic and the White Knob contact is the Horse Creek detachment fault. Quartzite in the area is white, fractured and heavily iron-stained. Other varieties include both brown and purple quartzite. Shears and fracture zones in quartzite contain limonite, disseminated lead and zinc minerals, and malachite staining; these mineralized zones are isolated and sparse. Dolomite-limestone is brecciated, and contains heavy limonite stains and disseminated minerals. A mafic dike from 1.3 to 5 ft wide and an estimated strike of N. 85° E. with a dip ranging from 73° SE. to 50 to 70° NW., occurs at the detachment fault contact. The dike is a hydrothermally altered olivine-pyroxene porphyry, and contains anomalous values of lead and zinc.	Two adits, 115 and 90 ft, one 110-ft trench, 4 caved adits, and 12 pits averaging 10 ft in diameter. In 1947 and 1951, a small amount of ore containing lead and silver was produced.	A total of 12 chip, two random chip, one grab, and seven select samples were taken. Nine chip samples of sheared quartzite and dolomite contained 23 ppm to 0.38% lead, 25 ppm to 0.28% zinc, and 0.1 ppm to 0.96 oz/ton silver. Three chips of mafic dike contained 60 to 415 ppm lead, 710 ppm to 0.46% zinc, and 0.1 to 0.4 ppm silver. Three select samples of sheared quartzite contained from 0.14 to 1.52% lead, 0.13 to 0.74% zinc, 2.4 ppm to 3.5 oz/ton silver, and 125 ppm to 0.84% copper. Two select samples of sheared dolomite contained 0.13 and 0.25% lead, 0.24 and 0.35% zinc, 0.14 and 0.23 oz/ton silver, and 2.16% and 138 ppm copper. Two samples contained 45 and 15 ppb gold. Structural activity in this area is intense but mineralized zones were spotty and sparse and not widespread. Further study would be necessary to determine the significance of anomalous metal values, especially in relation to the Horse Creek detachment fault.
32	Cleopatra prospect*	The adits are in white Kinnikinic Quartzite stained yellow-brown by limonite.	Two caved adits and one partially caved adit. No production.	One grab sample of quartzite contained 172 ppm lead and 214 ppm zinc; one select sample contained 50 ppm lead and 82 ppm zinc. Other samples of Kinnikinic Quartzite in the study area contained similar anomalies. Because of lack of any exposed mineralized structures in the area, no further study is recommended unless in conjunction with a study of the Badger Creek area.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
33	Triumph prospect*	Workings explore fractures in the Kinnikinic Quartzite just west of the Badger mine. Fractures are filled with secondary copper, lead, and zinc minerals, and minor amounts of iron and manganese oxides.	One caved adit, one caved shaft, one trench, and two pits. No known production is recorded.	One chip and two select samples were collected. The chip sample of fractured quartzite contained 860 ppm lead, 670 ppm copper, 30 ppm zinc, and 3.9 ppm silver. Select samples of stockpile material contained 1.23 and 1.95% lead, 0.25 and 1.95% copper, 40 ppm and 0.13% zinc, and 1.28 and 2.63 oz/ton silver. The occurrence is too low in grade to be considered a resource. However, the presence of anomalous values of base and precious metals in the quartzite indicates the possibility of further mineralized zones at depth. This property is similar to the Valley View mine, and would warrant further study in an evaluation of the Badger Creek area as a whole.
35	Rainbow prospect (see fig. D-13)	The workings explore interbedded quartzite and dolomite of the White Knob Group. The upper part of the claim is cut by a shear that strikes N. 29° W. and dips 90°; it is exposed in an adit for 75 ft. The shear zone consists of heavily iron-stained pulverized quartzite and dolomite. Much of the shear has been replaced by limonite and hematite. The lower area consists of a mafic dike, 7 ft wide, intruding a purple-brown quartzite. The dike appears to have a trend of N. 12° E.	One adit caved at 65 ft and one 22- by 10-ft cut.	Six chip and three grab samples were taken. Six samples of sheared quartzite and dolomite contained from 17 to 404 ppm lead, 463 ppm to 0.32% zinc, and 14 to 112 ppm copper. One grab sample of quartzite contained 0.22% lead, and one grab sample of dike contained 49 ppm lead, 86 ppm zinc, and 73 ppm copper. Anomalous metal values are found at other prospects in the White Knob Group in the Badger Creek area. Further study would be necessary to determine the significance of these anomalies.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
36	Bar No. 2 prospect (see fig. D-13)	Workings explore an area of about 1,100 ft by 400 ft in the White Knob Group and Saturday Mountain Formation with possible exposures of the Kinnikinic Quartzite. The claim is in part of a klippe or erosional remnant of the Horse Creek glide block. There is an alternating sequence of white quartzite and limestone-dolomite with some layers of black shale and brown quartzite. White quartzite is brecciated with heavy iron stains and fracturing. Limestone-dolomite is heavily fractured with moderate iron stains and some brecciation. Brown quartzite is brecciated and fractured; black shale is fractured with minor iron stains. Shearing in the area is primarily east-west and consists of pulverized limestone-dolomite or quartzite with heavy limonite between fractures. Mineralized zones occur primarily in brown quartzite and consist of stains and blebs of malachite, azurite, and cerussite. Some copper stains occur in the white quartzite. Similar mineralized zones occur at the Badger Creek prospect.	One 10-ft-deep shaft with about 45 ft of drifting; one adit 43 ft long, one 50-ft-long trench, and two pits.	Eight chip and two select samples were taken. A chip sample of the brown quartzite contained 0.35% copper, 1.64% lead, 3.56 oz/ton silver, 0.02% zinc, and 5 ppb gold. All other samples contained copper and zinc below 0.06%, and lead below 0.5%. Silver was below 24 ppm. Mineralized zones are primarily in or at the contact with the brown quartzite and white quartzite. Similar metallic content occurs at the Badger Creek prospect. The brown quartzite contains minable grades, but there was insufficient exposure of the zone to do a detailed evaluation. More exploration is needed of this contact zone both here and at the Badger Creek prospect to delineate the mineralized zones both at depth and laterally.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
37	Nipper prospect (see fig. D-13)	Workings are in the White Knob Group, the Saturday Mountain Formation, and the Kinnikinic Quartzite. The Horse Creek detachment fault extends through the area. Brecciated, iron-stained quartzite is in contact with brecciated, iron-stained dolomite, sandstone, and black shale at the central workings. The contact trends N. 78° E. and dips 20° NW.	Three adits, 75, 40, and 8 ft long, two caved adits, and one pit.	One random chip and seven chip samples were taken. Three chip samples of black shale contained 325 to 680 ppm lead and 135 to 245 ppm zinc. Four chip samples of quartzite contained 94 ppm to 0.17% lead and 17 to 38 ppm zinc. One random chip of dolomite and sandstone contained 0.18% lead, 315 ppm zinc, and 231 ppm copper. One sample contained 5 ppb gold and two contained 10 ppb gold. Anomalous metal values are similar to other prospects in the area. Further study of the area as whole would be necessary to determine the significance of these anomalies.
38	Bar No. 7 prospect* (see fig. D-13)	Workings explore iron-oxide stained shears and fractures in the Kinniknic Quartzite. A 0.75-ft shear strikes N. 85° W. and dips 44° NE. Copper and manganese staining were observed along fractures.	One 4-ft adit; two pits. No production.	One select and two chip samples were collected. Two chip samples of sheared quartzite contained 46 and 85 ppm lead; one sample contained 10 ppb gold. One select sample of quartzite contained 380 ppm lead, 52 ppm zinc, and 58 ppm copper. Sampling indicates anomalous metal values similar to other samples of Kinnikinic Quartzite collected in the area. No further work is recommended unless in conjunction with an evaluation of the Badger Creek area.
39	Badger Creek borrow pit*	Mineral material site for rip rap in Precambrian quartzites of the Wilbert Formation.	Unknown.	The site was approved for use in 1987 by the Forest Service.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
40	Cedar Post prospect*	Workings are at the contact between the Kinnikinic Quartzite and Precambrian quartzites. The area is in the lower plate of the Badger Creek Thrust Fault, and has been sheared and brecciated. Fractured and brecciated quartzite is heavily iron stained and manganese stained. No other mineralization was observed.	One 50-ft adit; one caved adit; and four small pits.	One grab and one select samples of dump material were collected. One sample contained lead, copper, zinc, and silver very close to average crustal abundance values for quartzite. The other showed somewhat enriched values of lead, 0.022%, and zinc, 0.008%. No further study is recommended unless in conjunction with a study of the whole Badger Creek area.
41	Badger Creek prospect* (see fig. D-13)	Workings explore an area where the Kinnikinic Quartzite, Saturday Mountain Formation, and possibly the White Knob Group are exposed. A klippe or erosional remnant of the Horse Creek glide block lies just northwest of the workings. Most of the rock exposure is near the contact between brown quartzite and a white quartzite. A bed of black shale is exposed at the adit and is in contact with brown quartzite. The brown quartzite is brecciated and iron stained. The black shale is fractured with iron stains and calcite stringers throughout. Mineralized fractures in brown quartzite contain disseminated lead and zinc minerals with blebs and stains of malachite and azurite. Mineralized zones resemble that at the Bar No. 2.	One 40-ft adit and two trenches, 60 and 71 ft. Three pits in alluvium were not sampled.	Four select and two chip samples were taken. Three select samples of brecciated mineralized brown quartztite contained 2.07, 3.72, and 1.83% of copper, and 4.02, 6.27, and 17.2 oz/ton silver. One chip of quartzite and one of black shale contained 38 ppm lead, 250 ppm zinc, and 100 ppm copper, and 36 ppm lead, 250 ppm zinc, and 78 ppm copper, respectively. Gold (5 ppb) was detected in three samples. Metallic values represent a minable grade, but mineralized zones were insufficiently exposed to do a detailed evaluation. Similar values are also seen at the Bar No. 2 area. Further work needs to be done to better delineate mineralized zones laterally and at depth.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
42	Little Pittsburgh mine* (see fig. D-14)	Workings explore fault and shear zones in the Kinnikinic Quartzite in contact with the Wilbert or Summerhouse Formations below the Horse Creek detachment fault. Locally, a calcareous unit is interbedded within the quartzite, and there is evidence of folding. The main adit at elevation 7,114 ft explores fault zones containing gouge and brecciated quartzite and calcareous quartzite at the contact. The fault zone in the main stope strikes N. 25° W. and dips 36° SW., is 2 to 40 ft wide, and contains secondary oxide minerals of lead, zinc, and silver. Two other adits explore smaller but similar structures containing secondary oxide minerals in Kinnikinic Quartzite.	Three adits, 1,000 ft, 430 ft, 250 ft. Two caved adits, one trench. About 3,000 tons were mined from the main stope; there is no recorded production.	Twenty-eight chip and two select samples were collected. Four chip samples of the sheared contact between quartzite and calcareous quartzite from the main stope contained from 0.26 to 15.0% lead, 5.4 ppm to 1.81 oz/ton silver, and 0.13 to 0.92% zinc. Ten chip samples of quartzite from adit at 7007 ft contained 145 ppm to 2.62% lead; nine of these contained from 0.1 to 3.6 ppm silver, and one had 0.76 oz/ton silver. Six chip samples of shear zones in quartzite at adit at 6,914 ft contained 44 ppm to 1.25% lead, 0.1 ppm to 0.42 oz/ton silver, and 36 to 305 ppm zinc. Two select samples of quartzite contained 1.15 and 6.97% lead and 0.93 and 2.60 oz/ton silver. Two chip samples contained 10 ppb gold, The significant amount of metallic minerals warrants further study of the property, particularly in relation to other properties in the Badger Creek area.
43	Last Chance prospect* (see fig. D-15)	Workings explore the Kinnikinic Quartzite and Summerhouse Formation. The upper group is situated at a white quartzite and brown quartzite contact. The lower group consists of white, grey and red quartzites. Basalt was found on the dump from the lower group; no outcrop exposure was found. Quartzites are fractured and have calcite stringers throughout. Iron stains occur in bands, alternating from light to heavy concentrations. Mineralized zones occur in shears found in the brown quartzite and consist of disseminated blebs and streaks of galena, plattnerite, and sphalerite. The shears strike N. 80 to 84° W. and dip 80°-84° NE. Mineral occurrences here are similar to those at the Wilbert, Great Western, and Lookout mines.	The upper group consists of three adits (160, 70, and 6 ft long), one inclined shaft, three caved adits, and five trenches and pits. The lower group, located from 2,000 to 3,000 ft southwest from the upper group, consists of three pits and one caved adit (not shown on figure).	Nine chip, seven select, and one grab sample were taken. Three chip samples of the mineralized shear in adit 1 contained from 0.20 to 15.6% lead, 0.36 to 2.63 oz/ton silver, and 3.52 to 7.63% zinc. Three select samples from stockpiles contained from 14.3 to 57.2% lead, 1.44 to 7.93% zinc, and 1.11 to 8.44 oz/ton silver. One chip sample contained 5 ppb gold. Metallic content does represent a minable grade, however, mineralized zones were insufficiently exposed to determine resources. Further work at the upper area needs to done to delineate mineralized zones and structures, both laterally and at depth.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
44	Red Bird prospect	The working is in the Saturday Mountain Formation just west of the Badger Creek Thrust Fault in the lower plate. Limestone is heavily encrusted by iron minerals with blebs of quartz. No other mineralized structures were observed.	Shallow pit.	One select sample of encrusted limestone with quartz contained 215 ppm copper, 215 ppm lead, and 20 ppm zinc.
45	Valley View mine* (see figs. D-16 to D-18)	Most of the workings are in Kinnikinic Quartzite or in Saturday Mountain Formation dolomite near the contact with the quartzite. The workings in the Kinnikinic explore occurrences of plattnerite in fracture fillings and shear zones in quartzite. The upper workings explore mineralized faults and shears up to 4 ft thick in quartzite and dolomite. Fine-grained galena also occurs in pockets and as stringers in brecciated quartzite. Most shears strike northeasterly and dip moderately to steeply to the northwest or southeast. The property is in the lower plate west of the Badger Creek Thrust Fault. Smaller occurrences and similar anomalous metals are found at other prospects in the Kinnikinic Quartzite, such as the May Queen and the Ajax mine.	There are 18 adits (4 caved), 18 trenches, and 15 pits in an area about 2,200 by 2,000 ft. More than 2,020 ft of underground workings were developed. No recorded production.	Thirty-three chip, three select, four grab, and one random chip samples were collected. Eighteen chip samples of fracture fillings and shear zones from the lower workings contained 0.1 ppm to 1.37 oz/ton silver, 80 ppm to 4.9% lead, and 26 ppm to 0.12% zinc. Sixteen chip samples of mineralized shear zones from the upper workings contained 0.003 to 1.31 oz/ton silver, 0.07 to 4.48% lead, and 0.007 to 0.15% zinc. Select samples contained from 0.5 to 1.99 oz/ton silver, 4.08 to 7.37% lead, and 0.03 to 0.57% zinc. Grab samples contained from 0.09 to 21.04 oz/ton silver, 0.09 to 23.1% lead, 0.05 to 0.67% zinc, and 0.02 to 0.15% copper. Resources were not calculated because of the low grade. The mineralized zones do not extend south into the study area. Further study is recommended to determine the size and extent of the mineral occurrences, particularly in relation to other occurrences in the Badger Creek area.
46	Eightmile Canyon placer prospect	Quaternary glacial and landslide deposits rest on limestone bedrock. The deposit is 6 to 15 ft thick and contains poorly sorted and semi-rounded sedimentary rock.	A dam and possible evidence of ground sluicing are scattered for about 1/4 mi along the north side of Eightmile Creek.	Four pan samples were taken along the deposit-bedrock contact. No placer gold or other heavy minerals were found. No further study is recommended.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
47	Uncle Ike Creek prospect	A lens or vein of limonitic jasper cellular sponge containing oxidized lead and zinc minerals occurs at the contact between the Saturday Mountain Formation and Kinnikinic Quartzite. The structure was not exposed well enough at the surface to determine its dimensions. The contact is generally north-northwest trending and dips steeply towards the east.	One caved adit probably 20 ft long and two small pits.	One select sample of lens contained 0.027% lead, 0.11% zinc, 0.003% copper, and 0.3 ppm silver. This isolated lens or vein is not considered a resource, but is indicative of the type of replacement occurring in carbonate rocks of Ordovician age.
48	Copper Mountain mine	All underground workings are now caved, and the mine area has been worked over with bulldozers obscuring the main structure. The workings explored a fracture-filled fault zone and shear zones in dolomite of the Jefferson Formation. According to previous investigations, a N. 40 to 50° W., 10 to 20° SW. dipping fault zone had a strike length of 500 ft. The zone is oxidized, and contains iron oxide minerals, gouge, and vein material with malachite, azurite, chrysocolla, chalcocite, galena, cerrusite, and silver. Veins pinch and swell and are discontinuous. They range from fractions of an inch to 6 ft in width (Nickelson, 1955). The fault zone is a branch of the Uncle Ike Creek Fault, and offsets the Black Canyon Thrust Fault.	Workings prior to caving included: one adit totaling 120 ft, one 30-ft adit, three caved adits, and one caved shaft. Surface workings include a 500-ft bulldozer cut at the main workings, and eight trenches and one pit south of the main workings. USBM production records indicated 50 tons of ore were produced in 1941, 1954, and 1955, and contained from 12 to 18% copper and from 0.3 to 2 oz/ton silver. According to Nickelson (1955) a total of 62 tons were mined containing from 15 to 20% copper. An 18-ton stockpile averaged 14% copper.	Two select samples of mineralized dolomite from the bulldozer trench contained 5.18 and 12.6% copper, 750 and 90 ppm lead, and 600 ppm and 0.3% zinc. Two select samples of oxidized vein material contained 0.26 and 0.31% zinc, 400 ppm and 0.19% lead, and 28 and 134 ppm copper. Small amounts of silver, from 0.1 ppm to 0.29 oz/ton, were detected in all samples. Previous investigators indicated mineralization was spotty and localized, and did not warrant further development (Romischer and Alvord, 1958). Similar mineral deposits occur at the Copper Mountain No. 8 and Bighorn mine to the south, and further study of the area may be warranted.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
49	Copper Mountain No. 8 prospect	The workings explore leached fracture fillings in shear zones containing hematite and limonite at the contact of the Jefferson and the Middle Canyon Formations just west of the Black Canyon Fault.	Four shallow trenches and one pit.	One continuous chip sample across the contact of dolomite and quartzite contained 59 ppm copper, 25 ppm lead, 355 ppm zinc, and 0.1 ppm silver. Two select samples of hematite and quartz fragments in breccia contained 50 and 96 ppm copper, 0.26 and 0.27% lead, 0.48 and 1.00% zinc, and 0.18 and 0.31 oz/ton silver. Mineralized zones are too localized and limited in extent to constitute a resource. However, occurrences are similar to those at the Bighorn mine, 3/4 mi south, and the Copper Mountain mine, 1/2 to 3/4 mi north. Therefore, further study may be warranted in conjunction with these mines.
50	Whitebird mine* (Mormon Gulch Nos. 4-7; Staley) (see fig. D-19)	Workings are in sheared limestone and shale of the Carboniferous Middle Canyon Formation. The main workings are inaccessible, but examination and sampling of dumps and other workings indicate that vein material in shear zones had been mined. The material contains galena, lead, and zinc oxides, calcite, associated silver, and iron oxide. Barite vein material was also found. Taber (1949) reports a leached vein containing galena, barite, and limonite in a fault zone. The vein is 50 ft long, 1 to 3 ft wide, 120 ft deep, strikes N. 75 to 80° W., and dips 65 to 80° NE. The fault zone is 5 to 8 ft wide, and also contains pods of mineralized material up to 2 ft wide. The mine is east of the Black Canyon Thrust Fault in the upper plate.	Two caved shafts - one was 120 ft deep with five levels totaling 170 ft; two caved adits - one was 100 ft long; two adits each 35 ft long. USBM production files reported a small amount of ore containing 3.5 oz/ton silver and 15% lead was produced in 1948. Taber (1949) reports by 1949, 75 tons averaging 17% lead had been mined.	Eleven samples were collected, including four chip, five select, and two grab. Three chip samples of vein material contained from 0.13 to 0.15% zinc and 180 and 475 ppm lead. Five select samples of the highest grade material from the main workings contained from 0.2 to 17.9% lead, 0.03 to 7.16% zinc, and 0.03 to 2.07 oz/ton silver. Three chip samples collected by the USBM in 1943 and 1949 contained from 1.6 to 19.3% lead and 0.1 to 5.0 oz/ton silver (Taber, 1949). Taber (1949) estimated as much as 500 tons of indicated and 1,000 tons of inferred resources remained, containing 10 to 15% lead and 3 to 4 oz/ton silver. Further study is required to determine the size and extent of additional resources at depth. This deposit could not be traced into the study area, although similar occurrences can be found to the northwest at the Copper Mountain No. 8.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
51	Fallert Springs prospect	Contact between white quartzite and an iron-stained purple quartzite in the Precambrian Wilbert Formation.	None	One continuous chip sample across the contact contained 0.4 ppm silver, 230 ppm copper, 1 ppm lead, and 70 ppm zinc.
52	Bighorn mine* (Mormon Gulch Nos. 1-3, Jernberg, Metta mine) (see fig. D-20)	Workings are on either side of the contact between limestone and shales of the Middle Canyon Formation and dolomite of the Jefferson Formation just west of the Black Canyon Thrust Fault. The area is complexly folded and faulted with many east-west trending shears. The shear zones contain replacement vein material with argentiferous galena and zinc minerals; the shears have been leached and contain iron and manganese oxides as well as gouge. Two shear zones in the main adit strike N. 85° E. and dip about 60° SE.; veins ranged from 0.5 to 2 ft thick and shear zones up to 7 ft thick. One shear zone in the westernmost caved shaft strikes N. 85° E. and dips 70° NW., and is 4 ft wide (Kiilsgaard and others, 1951).	One adit totaling 162 ft, one caved adit, one caved 85-ft inclined shaft, two caved shafts, four trenches, and several dumps. USBM production files record 156 tons of ore was produced between 1911 and 1917 and in 1948, containing 88,178 lb lead and 1,341 oz silver with a trace of gold.	A total of 13 samples were taken, including 10 chip and 3 grab. Six chip samples of shear and vein material contained from 0.04 to 2.37% lead, 0.003 and 0.88 oz/ton silver, and 0.06 and 0.17% zinc; one contained 10 ppb gold. One chip from the open stope contained 2.33% lead, 3.02% zinc, and 0.55 oz/ton silver. One grab sample contained 3.80% lead, 0.58% zinc, 0.90 oz/ton silver, and 0.013% copper. The remaining samples contained minor and anomalous amounts of zinc and lead. As much as 2,000 tons of inferred resources averaging 8% lead and 3 oz silver were estimated by Shaffer (1943) when the stopes were accessible. These occurrences could not be traced into the study area. They are similar to other lead, zinc, and silver occurrences in the Trail Peak area. Further study is warranted to determine the size and extent of these deposits.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
53	Sagebrush prospect	Workings are in unnamed Carboniferous limestones. Two shear zones containing brecciated limestone, gouge, and oxidized vein material are exposed in two adits. One shear zone strikes N. 20° W. and dips 30° NE.; the other strikes N. 55° W. and dips 25° NE. They are as much as 8 ft wide. High-grade vein material was found only in stockpiles.	Two adits, 44 ft and 75 ft; two caved adits; two trenches; and one pit were found. No production.	Twelve samples were collected, including seven chip, two select, and three grab. Four chip samples from a shear zone in the lower 44-ft adit contained from 86 to 300 ppm zinc and 20 to 360 ppm lead. Three chip samples from the upper 75-ft adit contained from 110 to 145 ppm zinc and only 5 to 9 ppm lead. Two high-grade select samples of vein material contained 3.5 and 4.0% lead, 11.1 and 12.6% zinc, and 0.73 and 1.99 oz/ton silver. Four samples contained from 5 to 20 ppb gold. These occurrences appear to be localized in this area. Additional exploration would be necessary to determine the significance of these and similar occurrences at the Bald Mountain Gulch and Minia prospects.
54	Lucky Billy prospect*	The workings are in quartzites and argillites of the Precambrian Gunsight Formation. The area is faulted, and locally northwest-trending shear zones contain disseminated lead and zinc minerals. The quartzite also contains some heavy mineral banding and copper minerals.	Two adits, 71 ft and 38 ft long. One caved adit, five trenches, 10 ft to 75 ft long, and a shallow pit.	Seventeen chip samples were taken across the shear zones. Silver ranged from 0.1 to 0.8 ppm; copper ranged from 20 to 240 ppm in six samples; lead ranged from 17 ppm to 0.26% in 14 samples; zinc ranged from 69 to 900 ppm in 14 samples. One grab sample of iron-stained soil at a quartzite-argillite contact contained 0.3 ppm silver, 20 ppm copper, 540 ppm lead, and 44 ppm zinc. One select sample from a stockpile contained 0.47 oz/ton silver, 6.27% lead, 0.22% copper, and 0.20% zinc. No extensive mineralized structures were found at the surface of this property, but sampling indicates possible mineralized zones at depth. Further work is necessary to determine the significance of anomalous metal values.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
55	Windfall prospect (Au No. 27)	Workings are in dolomite of the Jefferson Formation just west of the Black Canyon Thrust Fault in the lower plate. A fault zone trends north and dips 75° E. across the center of the property. Leached and oxidized vein material is found along fractures in dolomite. Mineral occurrences are similar to those at the Bighorn mine 1/2 mi north.	Two trenches and three prospect pits.	One chip sample of a fracture and four grab samples of oxidized vein material were collected. They contained between 55 and 780 ppm lead and from 85 to 760 ppm zinc. Further study is warranted in conjunction with a study of the Bighorn and Whitebird mines to determine the significance of these deposits.
56	UI Nos. 6 and 7 prospect	East-trending shear zones in Precambrian phyllitic quartzite contain quartz veinlets with minor amounts of copper and silver, and trace amounts of gold. Two generally east-west bedding plane shears, 14 and 37 ft long, range from 0.8 to 2.0 ft thick. A northeast-trending shear exposed for about 10 ft is 1.7 ft thick.	Two adits are 6 and 46 ft long; two trenches are 17 and 25 ft long. No known production.	One select and five chip samples were collected. Three chip samples of a quartz vein in the 46-ft adit contained from 370 ppm to 1.18% copper and 0.5 ppm to 0.41 oz/ton silver; two of these contained 25 and 65 ppb gold. The select sample contained 510 ppm copper, 0.5 ppm silver, and 105 ppb gold. Mineralization in these shears is too low in concentration to be considered a resource. Gold occurrences, however, may warrant further investigation.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
57	Sparrow prospect* (Au No. 24)	A trench is in dolomite of the Jefferson Formation east of the Black Canyon Thrust Fault in the upper plate. No mineralized structures are exposed. Leached and limonite replacement vein material was found on the dump.	One trench.	One grab sample of oxidized vein material contained 276 ppm lead and 148 ppm zinc. This occurrence is similar to those at the Black Canyon prospects and the Bighorn mine.
60	Red Ledge No. 8 extension prospect*	Workings are in quartzites of the Precambrian Wilbert Formation that are complexly faulted and folded with heavy mineral banding. A talcose phyllite unit with copper staining along fractures occurs in a small thrust fault contact with the quartzite.	Three shallow pits as much as 18 ft long and 10 ft wide.	Two chip samples of banded quartzite and of quartz conglomerate contained 0.2 ppm silver, 6 and 65 ppm copper, 21 and 38 ppm lead, and 17 and 31 ppm zinc, respectively. A select sample of talcose phyllite contained 0.3 ppm silver, 7 ppm lead, 18 ppm zinc, and 1.37% copper. No further work is recommended.
62	Nellie Boyd prospect	The working is at the Black Canyon Thrust Fault contact between the Summerhouse Formation and the Kinnikinic Quartzite. Country rock consists of a brown shale intermixed with brown quartzite. Dump samples show a breccia with quartz and quartzite and limonite filling in the matrix.	One 30- by 15-ft trench.	A grab sample of dump material contained 115 ppm lead, 31 ppm zinc, and 26 ppm copper. Anomalous metal values are also found to the south, at the Camp Creek prospects in the Saturday Mountain Formation just west of the Black Canyon Thrust Fault. Further study would be necessary to determine the significance of these occurrences.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
63	Ore House Nos. 7 and 8 prospect* (see fig. B-11)	These unpatented claims are adjacent to the Wilbert mine patent. Workings explore shear zones and fractures in Precambrian white and brown quartzites, and contain disseminated galena. The area is in a complexly faulted and folded zone west of the main Wilbert workings and the Black Canyon Thrust Fault. These same structures are found at the Great Western mine, 1-1/2 mi to the south.	Five adits, 5 to 30 ft long, one caved adit, and five pits. A small tonnage was probably produced from the adits, and was included in the Wilbert mine production.	A total of 14 samples were collected. Five chip samples of sheared white quartzite contained from 0.16 to 2.01% lead and 0.01 to 0.16% zinc; two contained 5 and 15 ppb gold. Two select samples of quartzite contained 18.8 and 44.8% lead, 0.41 to 1.11% zinc, 0.7 and 3.85 oz/ton silver, and 82 ppm and 0.24% copper. The area is 1/2 mi west of the study area, and was evaluated to determine if similar deposits occur within the study area. The mineralized occurrences can be found in the study area at the Great Western mine. These occurrences were traced discontinuously to the south through the Lookout mine to the Great Western mine.
64	Red Ledge No. 3 prospect*	Working explores quartzite of the Summerhouse Formation near a phyllite contact. The altered quartzite is heavily iron stained and brecciated with stringers of limonite.	One caved adit.	One select sample of quartzite was taken; it contained 110 ppm copper. No other anomomalous values were noted. No further work is recommended.
65	Camp Creek prospect No. 3*	Workings explore an intensely faulted area with folded overturned beds of quartzite of the Summerhouse Formation. The brown and white fractured quartzite is heavily iron stained with some calcite stringers. Very little outcrop is exposed at the workings.	Two pits, 34 by 10 ft and 10 by 5 ft, and one adit, caved at 100 ft (drift is timbered all 100 ft).	One chip and two select samples of quartzite were taken. They contained from 42 to 147 ppm lead and from 28 to 81 ppm zinc. Although no minable values were observed, this area lies between the Wilbert and the Lookout mines which have shown very good assays. More work in this area is needed, such as drilling and opening up of the adit, to delineate structures and any mineralized zones associated with it.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
66	Waymire prospect	The workings are in a gray to brown dolomite of the Saturday Mountain Formation, just west of the Black Canyon Thrust Fault. A shear zone as much as 9 ft wide with a strike of N. 10° W. and dips from vertical to 54° NE., is explored by two of the three workings. The other working consists of a shear striking N. 6° E. with a dip of 36 to 42° NW. The shears are primarily brecciated dolomite which is heavily iron stained and contains boxwork limonite. Similar but more mineralized prospects occur in the Saturday Mountain Formation, such as at the Sentinel mine.	One 15-ft caved shaft, one 34-ft adit about 700 ft northeast of the shaft, and one 8- by 5-ft pit.	Four chip samples of sheared dolomite and two grab samples of altered dolomite were taken. The chip samples contained from 35 to 347 ppm lead and 76 ppm to 0.16% zinc. The grab samples contained 148 and 309 ppm lead and 540 ppm and 0.10% zinc. Further study with other similar prospects at Camp Creek would be necessary to determine the significance of these anomalous values.
67	Camp Creek prospect No. 4*	Workings are at the Black Canyon Thrust Fault contact between the Saturday Mountain Formation and the Summerhouse Formation. Country rock consists of a dark brown to black dolomite in contact with a white to brown quartzite. Both units are highly fractured. At the contact is a shear zone about 8 ft thick striking northwest with a dip from 59 to 70° NE. The shear consists of decomposed and altered dolomite and quartzite with heavy iron and manganese stains.	One 25-ft adit and one caved adit.	One select and two chip samples of sheared dolomite were taken. They contained from 58 to 93 ppm lead and 16 to 510 ppm zinc. Similar occurrences are found at the Sentinel, Waymire, and other Camp Creek prospects. Further study of the Camp Creek area would be necessary to determine the significance of these anomalous values.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
68	Lookout mine* (patented) (see figs. D-21 and D-22)	Workings explore a thrust fault zone area between the Kinnikinic Quartzite and dolomite and quartzites of the Summerhouse Formation. In the main adit, a portion of fault zone in brown quartzite contains pods of white quartzite and is sheared. Fractures and shears are filled with secondary lead, zinc, and copper minerals and minor associated silver. The main zone is exposed for 60 ft and is about 35 ft wide. It trends N. 55° E. to N. 5° W., and is stoped to the surface. This zone could not be traced beyond the main workings. Fractures and shears at other workings in the area also contained secondary lead, zinc, and copper minerals with trace silver.	One 75-ft-long adit with a total of 180 ft of workings, including a stope to the surface. Two inclined shafts, one shaft, one caved shaft, eight trenches, and nine pits. Production was reported with the Wilbert mine production.	Thirty-six samples including 21 chip, 11 select, two random chip, and two grab, were collected. Eight chip samples from the main adit contained from 7.48 to 27.3% lead, 49 to 242 ppm zinc, 0.15 to 2.37 oz/ton silver, and 17 to 900 ppm copper. High grade select samples contained as much as 40.2% lead and 14.96 oz/ton silver. All samples contained significant amounts of lead and most contained significant amounts of zinc. Resources were not calculated because the main structure could not be traced beyond the workings. Mineralized zones are the same as the Great Western mine to the south and the Wilbert mine to the north. Further study is warranted to determine if mineralized zones extend north and south and at depth.
69	Camp Creek prospect No. 1*	The workings explore iron-stained shear zones in dolomite of the Saturday Mountain Formation west of the Black Canyon Thrust Fault. The shears consist of altered brecciated dolomite. The northwest-trending shears exposed in the main adit ranged from 0.4 to 6.8 ft in thickness over a 5 ft length.	Two adits, 130 ft and 30 ft.	Six chip samples of sheared dolomite were taken. Five samples were assayed only for gold and silver; one contained 5 ppb gold and two contained 0.4 ppm silver. One sample contained 48 ppm lead and 23 ppm zinc. Although no significant values were found, other prospects in the area contain similar structures.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
70	La Riviere Perdu Nos. 6 and 7 prospect* (see fig. D-23)	Workings explore the fault contact between Summerhouse quartzite and dolomite and the Kinnikinic Quartzite. Argentiferous galena fill fractures in the Kinnikinic Quartzite. Argentiferous galena, cerussite, and zinc minerals are found in sheared and brecciated zones of the Summerhouse quartzites and dolomites. Trace amounts of base metals are also found disseminated in the quartzites. One 70- ft adit exposes the fault gouge contact between the Kinnikinic Quartzite and Summerhouse quartzite for 70 ft. The zone trends N. 10° W., dips 35° NE., and ranges from 1.7 to 2.2 ft thick; no mineralization was observed. A bedding plane shear between quartzites and siltstone in the Summerhouse Formation is exposed for 135 ft in another working. The zone is 0.5 to 2.0 ft thick, trends northwesterly, and dips to the northeast; only minor copper staining and iron oxides were observed. A lens of limonitic jasper cellular sponge of lead and zinc minerals in dolomite is exposed for about 10 ft at the 9-ft shaft, 900 ft southeasterly.	One 135-ft incline with a 30-ft stope; one 70-ft adit; one 18-ft adit; one caved adit; one 9-ft shaft, eight trenches, and four pits. No production recorded.	Twenty-seven samples were collected. In the 70-ft adit, two chip samples of the shear zone contained 86 and 320 ppm lead, 60 and 380 ppm zinc; two chips of brown quartzite contained 250 and 630 ppm lead and 970 and 990 ppm zinc; one chip of white quartzite contained 49 ppm lead and 18 ppm zinc. In the 135-ft inclined shaft, four chips of brown quartzite contained 26 to 320 ppm lead and 18 to 105 ppm zinc; three chips of white quartzite contained 58 to 430 ppm lead and 14 to 36 ppm zinc. The lens of oxidized vein material contained 0.23% lead and 1.91% zinc. There are no main extensive mineralized structures in the area that could be considered a resource. Mineralization is similar to the Ore House Nos. 7 and 8 to the north and the Great Western to the south. Further study in conjunction with surrounding properties is recommended to determine the extent and depth of the occurrences.
71	Camp Creek prospect No. 2	Working is in sandstone at the base of the Summerhouse Formation east of the Black Canyon Thrust Fault on the upper plate. No ore minerals were observed in the heavily iron-stained zone exposed by the pit.	One 7- by 5-ft pit.	A 1.1-ft chip sample of iron-stained sandstone contained 45 ppm lead. No further study is recommended unless in conjunction with a study of the Camp Creek area.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
72	May Queen prospect (Ore House No. 24) (see fig. D-24)	Workings explore northwest-trending shears and fractures in Kinnikinic Quartzite. Three shears range from 28 to 48 ft long, 0.7 to 4.5 ft thick, and contain iron-oxide minerals. One fracture is 30 ft long, 3 ft thick, and contains disseminated galena and iron oxides.	Three adits are 6, 14, and 90 ft long; one 15-ft inclined shaft. No production.	Nine chip samples of sheared, iron-stained quartzite were collected. Two chips from the 90-ft adit contained 0.91 and 2.53% lead and 0.41 oz/ton and 3.5 ppm silver. One sample from the 6-ft adit contained 10 ppb gold. Six samples collected by the mining claimant contained 70 to 500 ppb of gold. This prospect warrants further investigation to determine significance of anomalous metal values, particularly gold.
73	Ore House No. 32B prospect	Workings are in a detachment block of limestone and dolomite of the White Knob Group just west of the Black Canyon Thrust Fault. Dolomite is sheared and iron stained, and contains quartz veinlets with vugs filled with limonite. Similar occurrences are found at prospects north of the mouth of Badger Creek Canyon.	Two pits.	One select sample of sheared, iron-stained dolomite contained 85 ppm copper, 25 ppm lead, and 0.42% zinc. One grab sample of iron-stained dolomite contained 86 ppm copper, 22 ppm lead, and 0.27% zinc. Anomalous metal values may warrant further study of this occurrence, especially in the White Knob Group 1/2 mi southwest of this property but outside the study area.
75	Rubie prospect (see fig. D-25)	The workings are in a complex area of faulting in the Saturday Mountain Formation and the Kinnikinic Quartzite. Rock from the dumps consists of altered, baked, and brecciated dolomite with abundant hematite filling fractures and as a stain. Another working explores an outcrop of iron and malachite-stained brecciated white quartzite. Minor blebs of galena were observed in the quartzite. The area is east of a klippe of Kinnikinic Quartzite and west of the Black Canyon Thrust Fault within the lower plate.	Two caved adits and one 20- by 6-ft trench.	One select sample of sheared, iron-stained dolomite contained 120 ppm lead, 155 ppm copper, and 47 ppm zinc. One select sample of quartzite contained 84 ppm lead and 255 ppm zinc. Similar anomalous metal values are found in other prospects at Camp Creek and at Badger Creek. Further study would be necessary to determine the significance of anomalous metal values in the South Creek area.

Map no.	Name	Summary	Workings and production	Resource and sample data
76	La Riviere Perdu No. 28 prospect (see fig. D-25)	Workings explore a klippe of Kinnikinic Quartzite near the contact with the White Knob Group in the South Creek glide block. Quartzite is heavily iron stained and contains stringers of limonite. Zones within the quartzite are brecciated with a limonite matrix.	Two trenches, 20 and 30 ft long.	Two select samples of iron-stained quartzite were assayed for gold and silver; they contained 0.3 and 3.0 ppm silver. The area is similar to the May Queen prospect, the Valley View mine, and the Pearl.
77	South Creek No. 4 prospect (see fig. D-25)	Workings explore a complexly faulted area in Summerhouse Formation dolomites and quartzites just east of the South Creek detachment. White quartzite and grey to brown dolomite are brecciated and sheared. Shears strike both northwest and northeast and consist of pulverized quartzite with heavy iron stains. Secondary lead minerals occur as streaks and blebs in the quartzite. There are minor malachite stains along fractures.	Two adits, with 70 and 75 ft of drifting, and one caved adit.	One grab and six chip samples of sheared, iron-stained quartzite were taken. Four chip samples from the 75 ft adit contained 276 to 650 ppm lead, 67 to 280 ppm zinc, and 1.4 ppm to 0.50 oz/ton silver. Two chip samples from the 70 ft adit contained 35 and 200 ppm lead, 50 and 68 ppm zinc, and 0.6 and 2.5 ppm silver. The grab sample contained 1.75 oz/ton silver. Silver values here do represent grades being mined in both open pit and underground operations. However, the workings here are insufficiently exposed to evaluate resources. The area also is in a zone of intense shearing and faulting which makes it difficult to delineate mineralized structures. Exploration is needed to determine the extent of the mineralized zones and delineate structures at depth.
78	Pearl prospect (see fig. D-25)	Workings explore the contact between the Saturday Mountain Formation and the Kinnikinic Quartzite in an area of complex faulting. Gray dolomite is brecciated and sheared with numerous calcite stringers. White quartzite is also brecciated with minor iron stains. Both rock types contain malachite staining. Mineralized quartzite observed on the dump contained disseminated galena(?) and malachite. Similar deposits in quartzite are found at the Silver King and La Riviere Perdu No. 28.	Two caved adits.	Three select samples of quartzite from the dump were taken. They contained from 12 to 23 ppm lead and 22 to 84 ppm zinc. The workings lie in an area of intense activity, and field observations indicate the presence of lead and copper minerals. Further work is needed to delineate mineralized zones both laterally and at depth and to obtain accurate analytical results.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
79	South Creek No. 10 prospect* (see fig. D-25)	The working is in iron-stained white quartzite of the Summerhouse Formation. In the adit, two parallel shears 4 ft apart strike N. 16° W. and dip 60° to 74° NE., and consist of pulverized quartzite, and iron-stained clay gouge. No ore minerals were observed.	One 87-ft adit.	Eight chip samples were taken. Four chips of sheared quartzite and gouge contained 10 to 25 ppm lead, 16 to 33 ppm zinc, and 23 to 37 ppm copper. Four chips of fractured quartzite between the shears contained from 6 to 18 ppm lead, 16 to 33 ppm zinc, and 10 to 25 ppm copper. No further work is recommended.
80	South Creek No. 16 prospect (see fig. D-25)	The area is in dolomite and quartzite of the Summerhouse Formation. The working is in iron-stained brown dolomite with a shear striking N. 28° E. and dipping 72° NW. The contact of the quartzite and dolomite is about 5 ft northwest of the pit and trends N. 29° E. The shear contains malachite and azurite occurring as fracture fillings and as a stain.	One 18- by 10-ft pit.	One chip sample of the shear contained 338 ppm copper and 0.4 ppm silver. One select sample from a small stockpile contained 1.71% copper and 0.49 oz/ton silver. This occurrence is similar to the copper-silver occurrence at the Great Western mine and the Silver King. Further study may be warranted to determine if a much larger deposit may occur at depth and extend to the south.
81	Ajax mine (Pickup; South Creek; South Creek No. 20) (see fig. D-28)	A series of parallel northeast-trending, northwest-dipping shears and faults in the Kinnikinic Quartzite are explored by workings in this area about 1 mi west of the Black Canyon Thrust Fault. In the main adit, lead (galena and plattnerite) and silver minerals are found along fractures and disseminated in white quartzite between and adjacent to two shears. The shears strike N. 10 to 50° E., dip 40 to 90° NW., and are less than 0.5 ft thick. The fracture zone between the two shears ranges from 2 to 5.5 ft thick and can be traced for 500 ft in the adit.	Workings include three adits - 42, 55, and 500 ft long; two caved adits; two open cuts; and three pits. USBM production files record over 150 tons of ore were produced in 1947 containing 28% lead, 4 oz/ton silver, and 0.07% copper.	Twenty-eight samples were collected, including 26 chip, 1 select, and 1 random chip. Eighteen chip samples of sheared and fractured quartzite from the main adit contained from 0.01 to 3.14% lead, 0.006 to 0.93 oz/ton silver, and 8 to 940 ppm zinc. One select sample contained 16.1% lead, 1.66 oz/ton silver, 440 ppm zinc, and 151 ppm copper. The remaining samples of sheared quartzite contained from 0.007 to 0.17% lead, 0.003 to 0.1 oz/ton silver, and from 13 to 860 ppm zinc. Metal values in the main adit are low in grade and are not considered resources. However, further study is warranted to determine the significance of this mineral occurrence. Similar deposits are found at the Valley View mine at Badger Creek and the May Queen prospect.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
82	South Creek No. 24 prospect* (see fig. D-25)	The working is in an area of thrusting and faulting in the Wilbert Formation. The quartzite is heavily iron stained with a shear striking N. 52° W. and dipping 15° SW.	One 15- by 5-ft pit.	One chip sample of quartzite contained 39 ppm copper and depleted lead (2 ppm) and zinc (6 ppm). No further work is recommended.
83	San Francisco prospect	Workings are in Summerhouse dolomite and Kinnikinic Quartzite east of the Black Canyon Thrust Fault in the upper plate. A major shear zone up to 7 ft thick containing siliceous limonitic vein material strikes N. 15 to 20° W., dips 70 to 90° NE., and extends for about 100 ft along the surface. About 70 ft is explored by workings. The shear contains chrysocolla, malachite, possibly chalcocite, and minor amounts of silver, lead, and zinc. Copper minerals also occur in fractures in dolomite and quartzite west of the shear zone.	One 12-ft adit with 11-ft winze, four caved adits, three pits. No production.	Eight samples were collected. Two chip samples of the shear zone contained 300 and 570 ppm copper, 900 ppm to 0.28% lead, and 0.19 and 0.29 oz/ton silver. A select stockpile sample contained 2.6% copper, 0.22% lead, and 4.6 ppm silver. One select sample of siliceous limonite contained 510 ppm lead, 100 ppm zinc, and 2.3 ppm silver. Mineralized shears and fractures are too small in size and low in grade to constitute a resource. Further study may be warranted in conjunction with other prospects to the south to determine the extent of occurrences.
84	South Creek No. 36 prospect* (see fig. D-25)	The working is in the Wilbert Formation which has an anticlinal fold in this area. A 4.5-ft shear zone at the contact between shale and quartzite strikes N. 10° E. and dips 50° SE., and is iron stained.	One 18- by 8-ft pit.	One chip sample of the shear was assayed for gold and silver; it contained 0.4 ppm silver. No further work is recommended.
85	South Creek No. 61 prospect* (see fig. D-25)	The working is in the Summerhouse Formation. Phyllitic shale has been cut by two shears which strike N. 11° W. and N. 18° E.; dip vertically and 65° NW., and contain veinlets and blebs of quartz with heavy iron stains. No other minerals were noted.	One 7-ft-deep shaft.	One chip sample of sheared phyllitic shale contained 52 ppm lead, 110 ppm zinc, and 0.4 ppm silver. No further exploration is recommended.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
86	South Creek Nos. 71-78, 88, 89 prospects (see figs. D-25 and D-26)	Workings are in Precambrian quartzite, dolomite, and argillite of the Wilbert and Swauger Formations. The area is complexly folded and faulted. The workings explore northwest-trending shears and faults containing quartz, calcite, barite, chalcocite, other copper minerals, and iron oxide minerals. A northeast-trending dike about 6 ft wide was also observed. No extensive mineralized zones were found.	Two adits, 50 and 100 ft long, two caved adits, three shafts, numerous pits and bulldozer cuts. No production.	A total of 18 samples were collected, including 13 chip, 3 select, and 2 grab. Five chip samples of sheared quartzite contained from 34 ppm to 4.20% copper and 0.1 ppm to 2.39 oz/ton silver. One select sample of altered quartzite contained 6.53% copper and 3.79 oz/ton silver. One chip sample of sheared argillite contained 9.38% copper and 4.43 oz/ton silver. One sample of the dike contained 0.44% copper. Four samples contained from 5 to 35 ppb gold. Copper occurrences appear to have associated silver and gold in this area. These occurrences are similar to those at the UI Nos. 6 and 7 and the Lucky Billy. Further study is necessary to determine the significance and extent of these occurrences.
87	South Creek No. 78 prospect (see fig. D-26)	The workings lie along the contact of dolomite of the Summerhouse Formation and the Kinnikinic Quartzite. Rocks along the contact consist of brown dolomite and white quartzite with iron staining. The area is in a zone of numerous northeast faults which have offset and displaced the dolomite and quartzite. Malachite, azurite, and chrysocolla occur along fractures and as stain.	Two pits, 18 by 10 ft and 5 by 4 ft.	Two select samples of mineralized sheared quartzite were taken of the dumps. They contained 5.03 and 10.8% copper and 0.19 and 0.69% zinc. Although similar to mineralized zones found at the Silver King, there is insufficient exposure to evaluate this property. Further exploration is needed to delineate mineralized zones.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
88	Protection prospect (BC Nos. 23 and 24) (see figs. D-29 and D-30)	Workings explore the Black Canyon Thrust Fault zone (N. 20-30° W.) between dolomite of the Saturday Mountain Formation, the Kinnikinic Quartzite, and quartzite and dolomitic quartzite of the Summerhouse Formation. The fault is sheared and is composed of siliceous limonite and altered dolomite and quartzite. Two main shear zones trending N. 10-40° W. are explored. One shear zone, exposed in the lower 80-ft adit between the Kinnikinic Quartzite and the Saturday Mountain dolomite, is 85 ft long and from 0.5 to 2.3 ft thick. The other shear, exposed in the upper 300-ft adit in the Summerhouse Formation, is 275 ft long and from 1 to 5 ft thick. No sulfide minerals were observed, although analyses indicate the shears contain trace to minor lead, zinc, copper, and silver disseminated throughout, which may indicate mineralized zones at depth.	Five adits are 10, 30, 80, 100, and 300 ft long. One adit is caved.	Thirty-seven chip, 2 select, and 3 grab samples were collected. Six chip samples of the shear zone in the 80 ft-adit contained from 30 to 200 ppm lead, 400 ppm to 0.42% zinc, 62 to 435 ppm copper, and 0.1 to 0.8 ppm silver. Ten chip samples of the shear zone in the 300 ft adit contained from 7 ppm to 0.35% lead, 58 ppm to 0.36% zinc, 14 ppm to 0.30% copper, and 0.1 to 5.8 ppm silver; chip samples of the wall rock were slightly mineralized. Six chip samples of shear zone and sheared wallrock from the 100-ft adit contained from 54 ppm to 0.59% lead, 440 ppm to 0.27% zinc, 9 to 220 ppm copper, and 0.1 to 7.5 ppm silver. Values here do not represent a minable grade. However, this area is along the Black Canyon Thrust Fault and is similar to other workings near this fault which have shown higher values, such as the Badger, Wilbert, and Great Western mines. Further exploration is needed to determine if mineralized zones occur at depth.
89	Silver King prospects* (South Creek Nos. 90-91, 103-104) (see fig. D-25)	The area consists of brown and white quartzites of the Summerhouse Formation. Poorly exposed faults and shears are parallel to the contact between brown and white quartzite which strikes N. 40° W. and dip 40° NE. Shear zones contain pods of vein material containing chalcocite, chrysocolla, malachite, azurite, and galena. Mineralization was also disseminated within the shear zone.	The property consists of one caved adit, one open pit (70 by 30 by 10 ft), one 9- by 5-ft pit, and five trenches (20 by 12 ft, 27 by 20 ft, 180 by 40 ft, 80 by 40 ft, and 70 by 10 ft).	Four select samples of the quartz vein and sheared material contained from 500 ppm to 33.5% copper, 3.1 ppm to 5.24 oz/ton silver, 6 ppm to 17.5% lead, and 840 ppm to 0.91% zinc. Two grab samples of quartzite contained 16 and 63 ppm copper. Values represent grades being mined, however, there was insufficent exposure of mineralized zones to delineate resources. Further exploration is needed to determine geologic structures and how they relate to mineralized areas at depth.

Map no.	Name	Summary	Workings and production	Resource and sample data
90	North Star prospect (South Creek No. 107) (see fig. D-25)	The workings are in quartzites and dolomites of the Summerhouse Formation in contact with the Kinnikinic Quartzite. The Kinnikinic Quartzite is white with iron stains along fractures. Blebs and pods of limonite and hematite occur throughout the Kinnikinic. Rock from the dumps also consisted of brecciated quartzite with clay gouge and minor malachite stains. Workings explored the contact with most of the mineralized areas occurring within the Kinnikinic. Similar copper occurrences are found at the Silver King.	One 4-ft adit, two caved adits, one caved shaft, and five trenches ranging in size from 40 to 55 ft long.	Three chip and four select samples were taken of white quartzite. Four select stockpile samples had copper values of 0.17, 1.87, 2.83, and 11.5%. The chip samples of iron-stained quartzite contained 7 to 100 ppm copper. Copper values here do represent minable grades but no exposures were found in place. More exploration is needed to delineate mineralized areas both laterally and at depth.
91	South Creek No. 121 prospect (see fig. D-25)	The working is in quartzite of the Summerhouse Formation. The quartzite is cut by a fault zone striking N. 35° W. and dipping 67° NE. The zone consists of hydrothermally altered quartzite with heavy iron stains and light malachite stains.	One 50-ft adit.	Two chip samples of altered quartzite from the adit contained 350 ppm and 0.71% copper, 0.40 and 0.21 oz/ton silver, 810 ppm and 0.11% lead, 102 and 121 ppm zinc, and 15 and 10 ppb gold, respectively. One grab sample of altered quartzite contained 160 ppm copper, 418 ppm lead, 61 ppm zinc, and 0.21 oz/ton silver. Similar mineralized zones occur at the Silver King and other prospects in this area. Further study of these occurrences is necessary to determine the significance of these anomalies.
92	South Creek No. 119 prospect (see fig. D-25)	The working is in a sliver of Wilbert Formation in the Summerhouse Formation. Purple quartzite has undergone intense shearing and is heavily iron stained. Shear zones strike N. 10° E. and have a vertical dip.	One caved adit.	One chip sample of fractured quartzite contained 135 ppm lead, 82 ppm copper, 16 ppm zinc, and 0.6 ppm silver. One grab sample of dump material contained 84 ppm lead, 182 ppm copper, 13 ppm zinc, and 0.6 ppm silver. Both contained 5 ppb gold. Further study would be necessary to determine the significance of these anomalous metal values.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
93	South Creek No. 147 prospect (see fig. D-25)	Workings explore fault contact between Summerhouse quartzites and Wilbert or Swauger phyllites. A shear zone cutting the phyllite has a strike of N. 5° E. with a dip of 25° SE. A fault trends N. 10 to 20° W. between the two workings with an 85° SW. dip. The shear contains leached vein material of limonite, minor quartz breccia, and gouge. The fault contains heavily iron-stained quartzite and limonite after pyrite pseudomorphs.	One 20-ft adit and one caved adit.	One chip sample of the shear contained 30 ppm lead, 38 ppm zinc, and 58 ppm copper. One select sample of brecciated quartzite contained 46 ppm lead, 35 ppm zinc, and 66 ppm copper. No significant mineralized structures were found. No further study is recommended unless in conjunction with a study of the South Creek mineralization.
94	Black Back prospect (South Creek Nos. 143, 149)	The working is in quartzites of the Summerhouse Formation. A shear zone strikes N. 50° W. and dips 36° SW. and was exposed for 200 to 300 ft on the surface. In the adit, the shear is up to 2.5 ft wide and contains white quartzite with a 0.5-ft stringer of galena. Galena is also disseminated in the brown quartzite wallrock. Light copper and iron staining occurs along fractures. Similar occurrences are found at the Great Western mine and at other South Creek prospects.	One 10-ft adit.	One chip and two select samples were taken. The chip sample of sheared white and brown quartzite contained 1.37% lead, 0.18 oz/ton silver, and 80 ppm zinc. A stockpile sample contained 4.39% lead, 1.08 oz/ton silver, 73 ppm zinc, and 5 ppb gold. A select sample of the shear contained 0.22% lead. Further study would be necessary to determine the significance of these anomalous values.
95	White Rock prospect	Galena is present in fractured white Kinnikinic Quartzite along east-west-trending shear zones (Anderson, 1948, p. 14).	Unknown workings and production.	This prospect was not found during the field examination.
96	BC No. 51 prospect	Fractured and silicified dolomite of the Jefferson or Saturday Mountain Formations contain quartz lenses and vein quartz up to 0.75 ft thick.	None.	Two chip samples of quartz did not contain anomalous gold or silver. No further work is warranted.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
97	BC No. 53 extension prospect	Workings explore small northwest-trending shear zones in interbedded limestone, shale, and argillite of the Middle Canyon Formation. The shear zones contain limonitic and siliceous fracture fillings with trace to minor amounts of secondary lead and zinc minerals. The area is in a fault zone east of and parallel to the Black Canyon Thrust Fault.	Two trenches and one pit.	Two chip samples and one grab were collected. All three samples of iron-stained fracture fillings contained from 44 to 320 ppm lead and 500 ppm to 0.65% zinc. Structures could not be traced beyond workings. Further study may only be warranted in conjunction with a major study of the Black Canyon area to determine the significance of anomalous metal occurrences.
98	BC No. 53 prospect	Workings explore leached pods containing secondary iron-oxide minerals in small northeast-trending shear zones in Jefferson dolomite. The pods also contain secondary lead and zinc minerals in siliceous iron-stained boxwork. Manganese oxides were also obseved along fractures. The area is in a fault zone east of and parallel to the Black Canyon Thrust Fault.	One 117-ft-long adit, one caved shaft, two trenches, one pit.	Ten samples were collected. Four chip samples of pod material contained from 0.01 to 0.28% lead and from 0.23 to 1.37% zinc. Two other chip samples of sheared, iron-stained dolomite contain anomalous values of lead and zinc. Shear zones and pods are discontinuous, and could not be traced beyond the area. Mineral occurrences are similar to those at the Badger mine. Further study may be warranted in conjunction with a major study of the Black Canyon area to determine the significance of metal occurrences.
99	BC No. 65 prospect	Workings explore lenses of secondary iron oxide material in a fault zone in the Kinnikinic Quartzite, east of and parallel to the Black Canyon Thrust Fault. The lenses, as much as 10 ft long, contain siliceous boxworks with oxidized iron minerals and secondary lead and zinc minerals. One fault strikes N. 10° W. and dips 85° SW.; another strikes N. 70° W. and dips 70° NE.	One trench and three pits.	Three chip samples of oxidized lens material contained from 20 ppm to 0.18% lead, 45 ppm to 0.14% zinc, and 29 to 353 ppm copper. One grab of pod material contained 0.25% lead and 1.53% zinc. The occurrences are similar to BC No. 53 to the north. Further study may be warranted in conjunction with a major study of anomalous metal occurrences in the Black Canyon area.

APPENDIX C.--Miscellaneous mines and prospects in and adjacent to the Diamond Peak study area--Continued

Map no.	Name	Summary	Workings and production	Resource and sample data
100	Minia*	The working is in limestone of an unnamed Carboniferous formation. A poorly exposed zone of iron-stained quartz and calcite is along a limestone bedding plane shear. The shear is 3.1 ft thick, trends northwest, and dips 10° to 15° SW.	One prospect pit.	One chip sample of sheared limestone contained 131 ppm copper and 41 ppm zinc. No further work is recommended.

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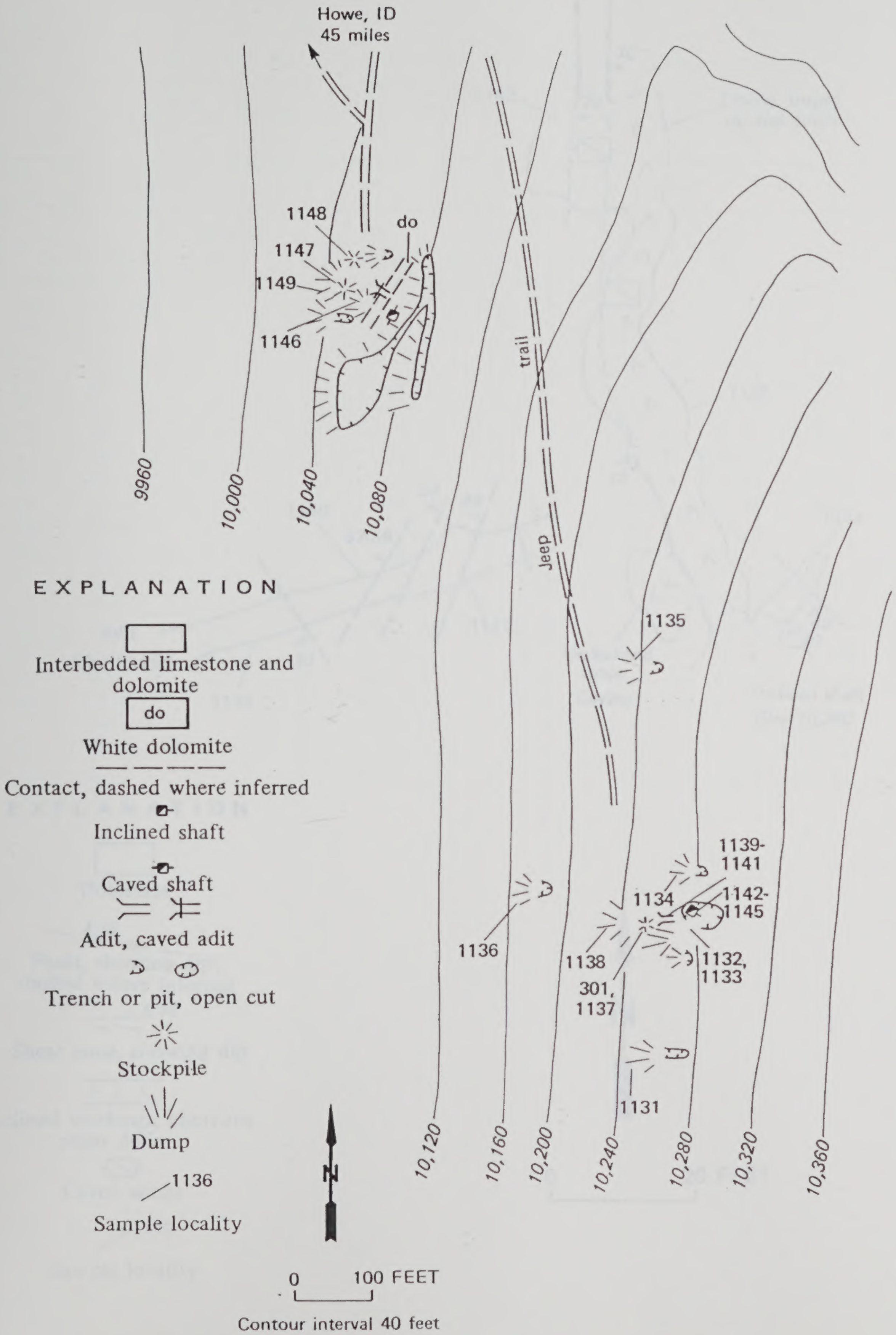

Howe, ID
45 miles
1148
do
1147
1149
1146
trail
Jeep
9960
10,000
10,040
10,080
10,120
10,160
10,200
10,240
10,280
10,320
10,360
1135
1139-
1141
1134
1142-
1145
1136
1138
1132,
1133
301,
1137
1131
EXPLANATION
Interbedded limestone and dolomite
do
White dolomite
Contact, dashed where inferred
Inclined shaft
Caved shaft
Adit, caved adit
Trench or pit, open cut
Stockpile
Dump
1136
Sample locality
N
0
100 FEET
Contour interval 40 feet

FIGURE D-1.— Surface map, Red Warrior mine

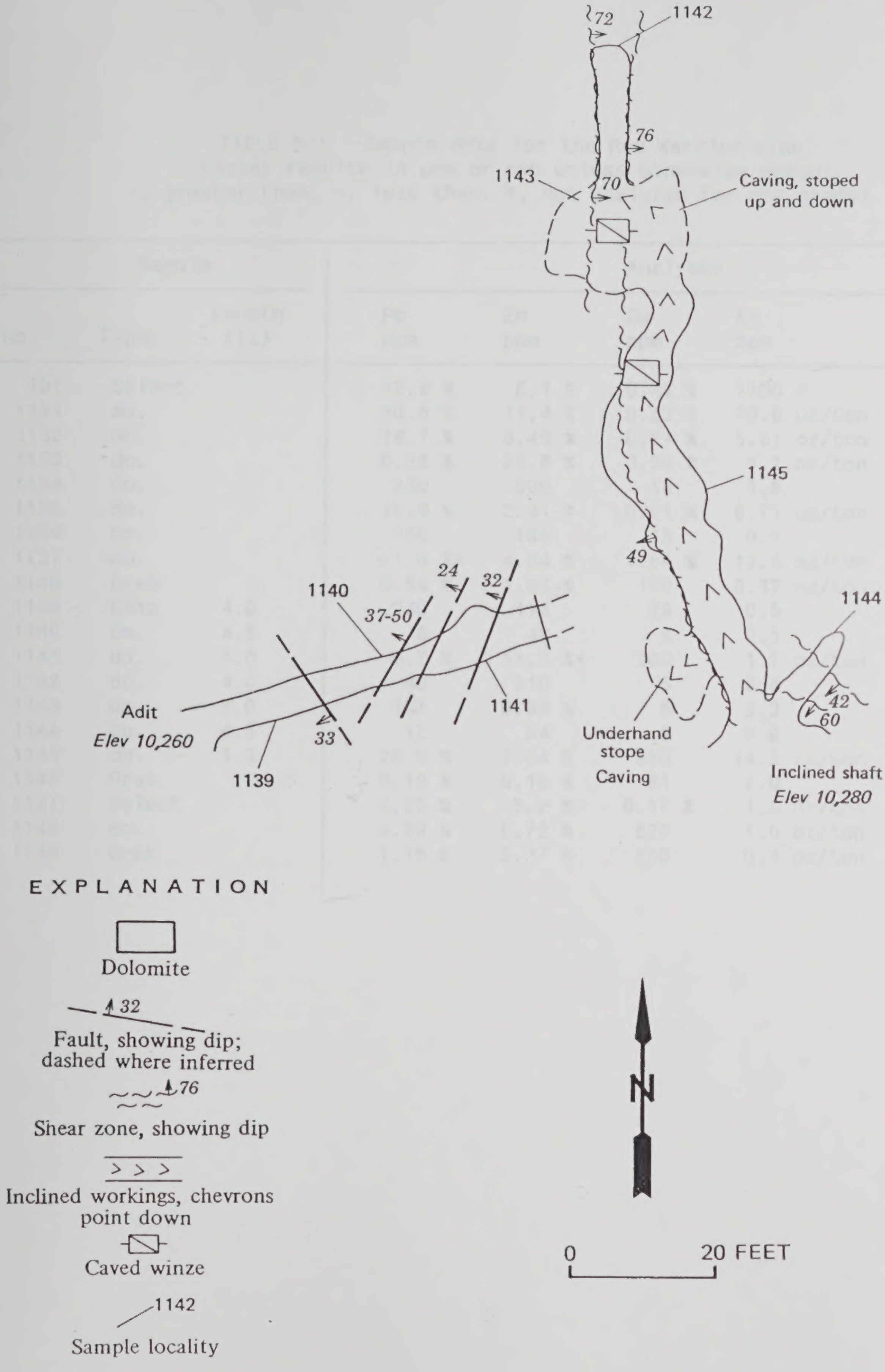

72
1142
76
1143
70
Caving, stoped up and down
1145
49
24
32
1140
37-50
1144
Adit
Elev 10,260
1141
33
1139
42
60
Underhand stope
Caving
Inclined shaft
Elev 10,280
EXPLANATION
Dolomite
32
Fault, showing dip; dashed where inferred
76
Shear zone, showing dip
Inclined workings, chevrons point down
Caved winze
1142
Sample locality
N
0
20 FEET

FIGURE D-2.– Underground map, adit and inclined shaft, Red Warrior mine

TABLE D-1.--Sample data for the Red Warrior mine
(Assay results in ppm or ppb unless otherwise noted;
>, greater than; <, less than: *, not analyzed for ore grade)

Sample			Analyses				
No.	Type	Length (ft)	Pb ppm	Zn ppm	Cu ppm	Ag ppm	Au ppb
301	Select.		12.9 %	6.1 %	0.45 %	>100 *	0.11 oz/ton
1131	do.		20.5 %	11.4 %	0.23 %	70.9 oz/ton	0.02 oz/ton
1132	do.		18.7 %	8.49 %	0.21 %	5.61 oz/ton	0.08 oz/ton
1133	do.		0.86 %	26.8 %	0.30 %	1.7 oz/ton	90
1134	do.		230	500	18	1.8	<5
1135	do.		16.9 %	2.41 %	0.21 %	6.71 oz/ton	0.07 oz/ton
1136	do.		360	135	13	0.1	<5
1137	do.		>1.0 %*	4.04 %	1.64 %	12.4 oz/ton	0.15 oz/ton
1138	Grab		0.59 %	1.34 %	190	0.37 oz/ton	140
1139	Chip	4.0	240	118	29	0.5	<5
1140	do.	4.5	6	43	4	0.1	<5
1141	do.	5.0	0.7 %	>1.0 %*	300	1.2 oz/ton	175
1142	do.	4.0	40	310	5	0.4	<5
1143	do.	4.0	132	0.36 %	6	2.3	5
1144	do.	4.5	12	54	2	0.2	<5
1145	do.	1.3	28.9 %	7.04 %	680	14.5 oz/ton	0.03 oz/ton
1146	Grab		0.19 %	0.16 %	61	2.0	15
1147	Select		4.22 %	5.2 %	0.17 %	1.3 oz/ton	245
1148	do.		6.39 %	5.72 %	520	1.5 oz/ton	290
1149	Grab		1.18 %	2.27 %	160	0.3 oz/ton	25

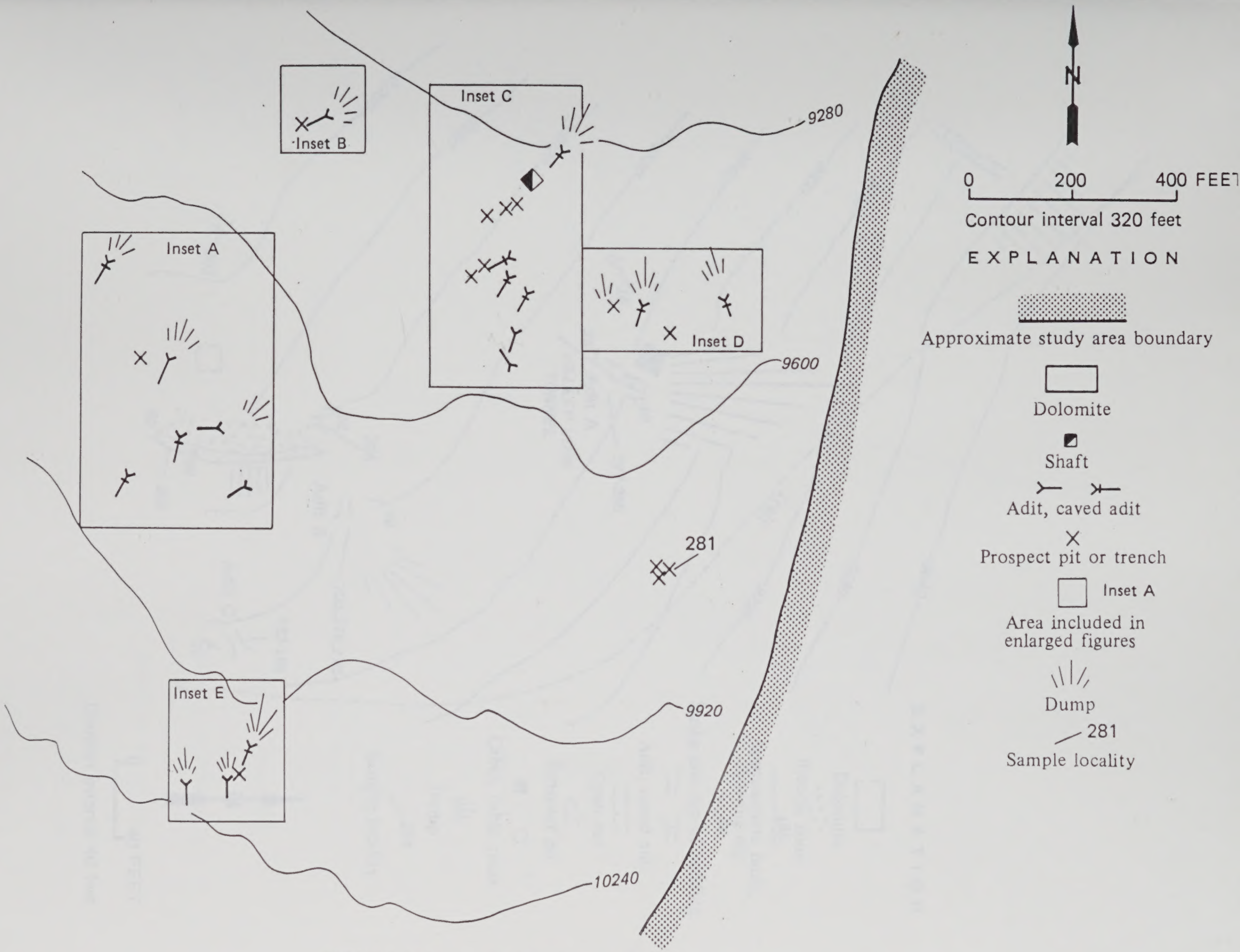

Inset A
Inset B
Inset C
Inset D
Inset E
9280
9600
9920
10240
281
N
0
200
400 FEET
Contour interval 320 feet
EXPLANATION
Approximate study area boundary
Dolomite
Shaft
Adit, caved adit
Prospect pit or trench
Inset A
Area included in enlarged figures
Dump
281
Sample locality

FIGURE D-3.– Surface map, Iron Mask mine

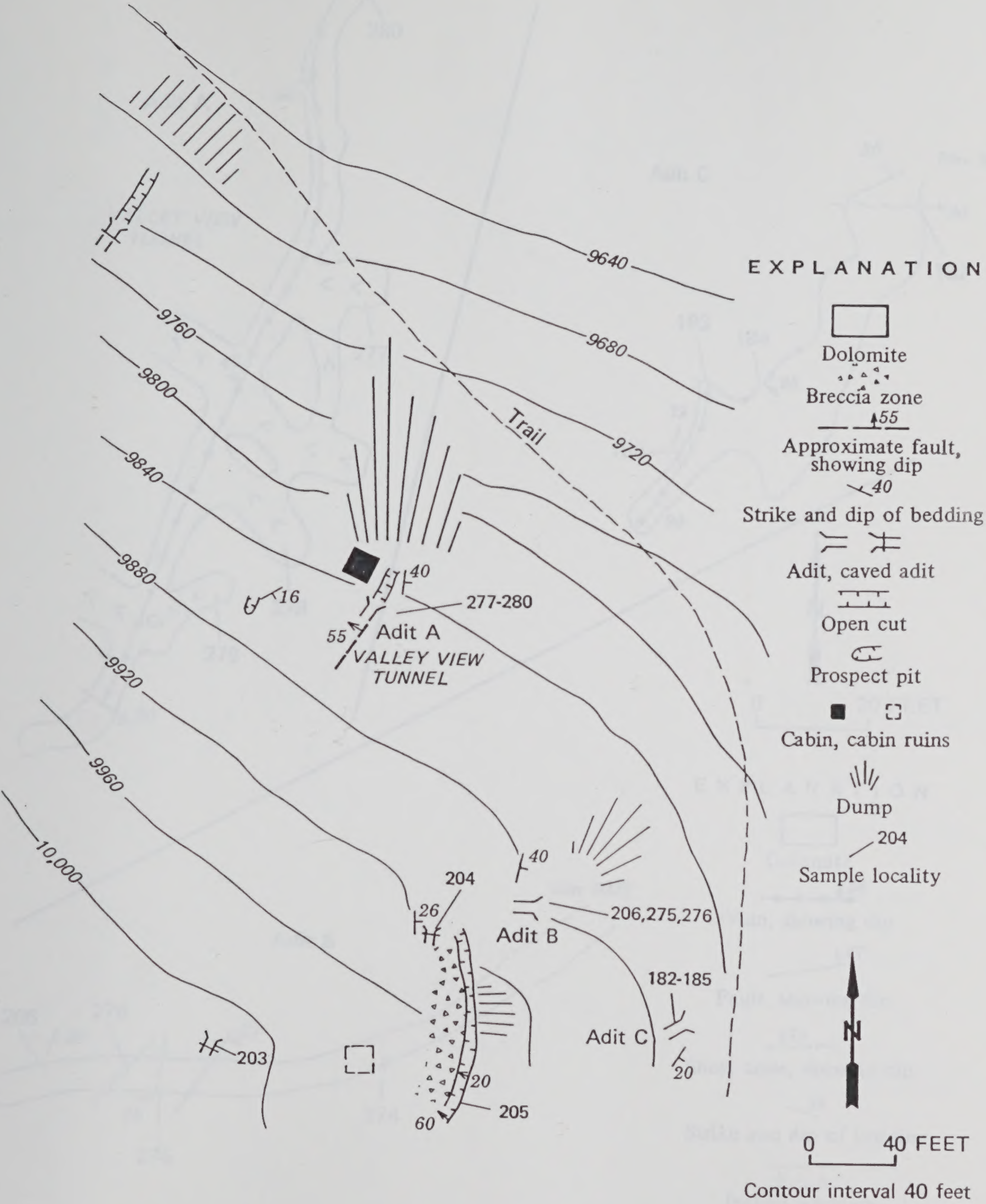

9640
9680
9720
9760
9800
9840
9880
9920
9960
10,000
Trail
40
16
277-280
55
Adit A
VALLEY VIEW
TUNNEL
40
204
26
Adit B
206,275,276
182-185
Adit C
20
203
20
205
60
EXPLANATION
Dolomite
Breccia zone
55
Approximate fault, showing dip
40
Strike and dip of bedding
Adit, caved adit
Open cut
Prospect pit
Cabin, cabin ruins
Dump
204
Sample locality
N
0
40 FEET
Contour interval 40 feet

FIGURE D-4.– Surface map, inset A, Iron Mask mine

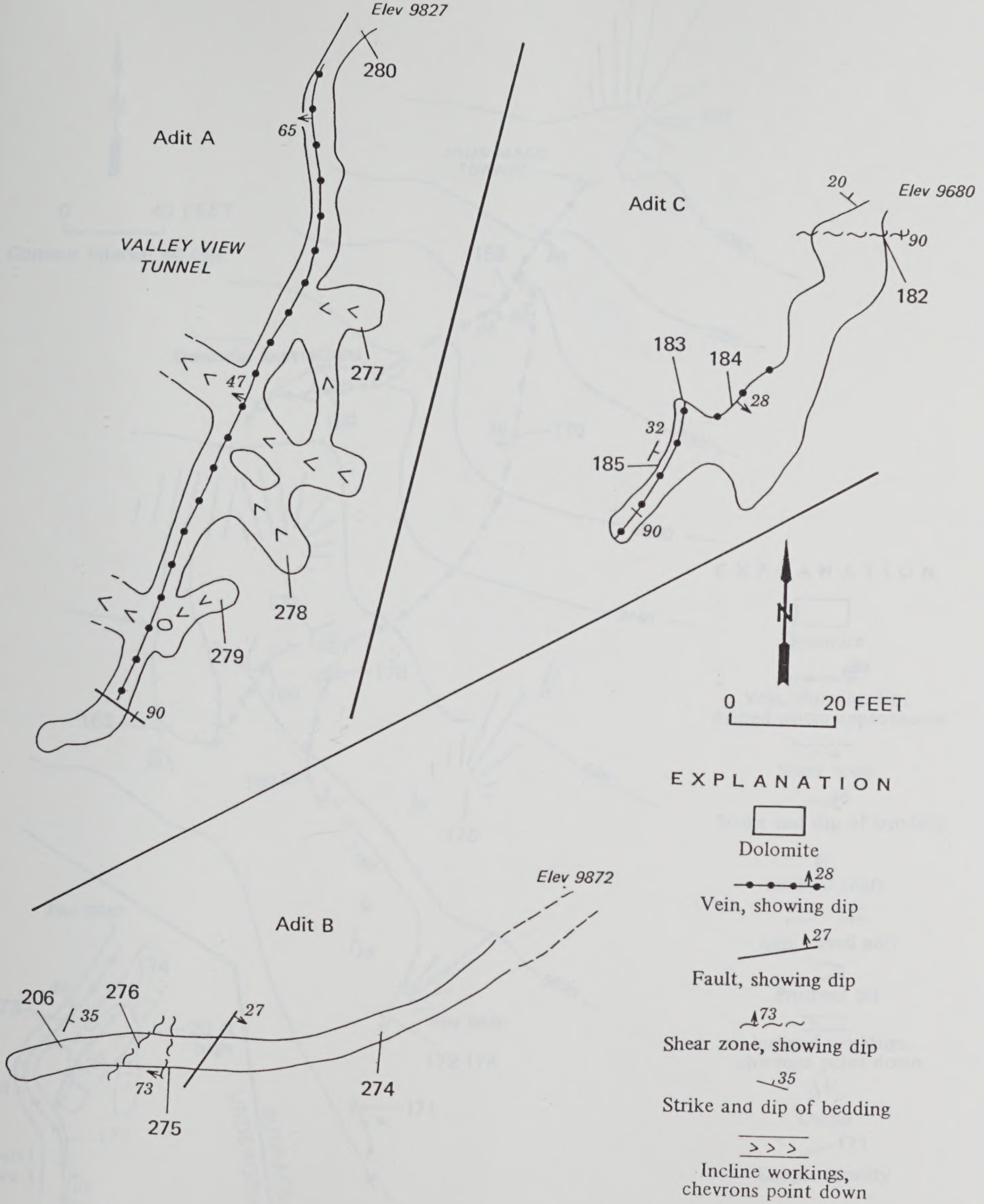

Elev 9827
280
Adit A
65
VALLEY VIEW TUNNEL
47
277
278
279
90
20
Elev 9680
Adit C
90
182
183
184
28
32
185
90
N
0
20 FEET
EXPLANATION
Dolomite
28
Vein, showing dip
27
Fault, showing dip
73
Shear zone, showing dip
35
Strike and dip of bedding
> > >
Incline workings, chevrons point down
276
Sample locality
Elev 9872
Adit B
206
35
276
27
73
275
274

FIGURE D-5.-- Underground maps, adits A, B, and C from inset A, Iron Mask mine

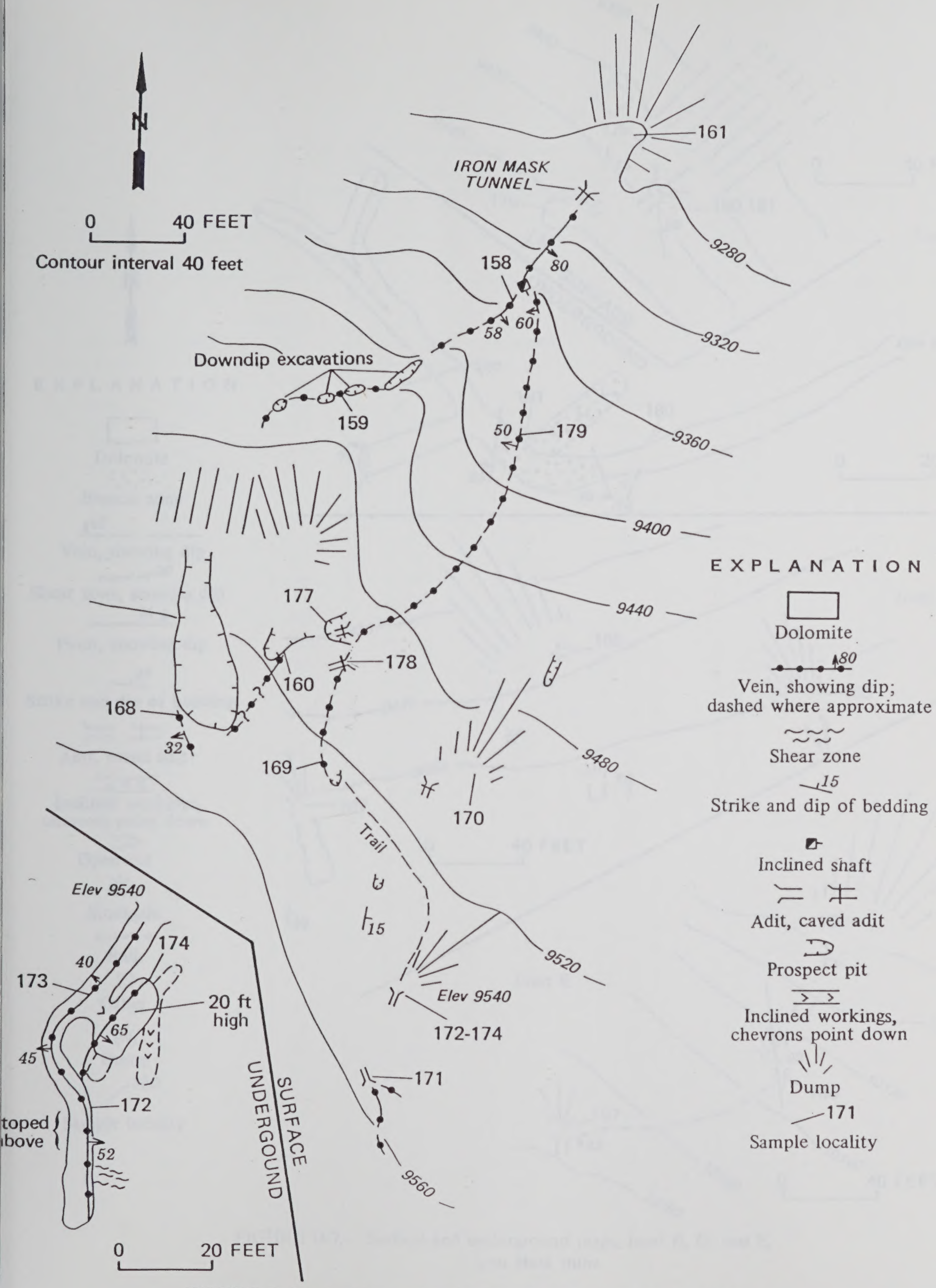

N
0 40 FEET
Contour interval 40 feet
IRON MASK TUNNEL
161
158
80
58
60
9280
9320
9360
9400
9440
9480
9520
9560
Downdip excavations
159
50
179
177
178
160
168
32
169
170
Trail
15
Elev 9540
172-174
171
Elev 9540
174
40
173
20 ft high
65
45
172
toped
bove
52
SURFACE
UNDERGOUND
0 20 FEET
EXPLANATION
Dolomite
80
Vein, showing dip; dashed where approximate
Shear zone
15
Strike and dip of bedding
Inclined shaft
Adit, caved adit
Prospect pit
Inclined workings, chevrons point down
Dump
171
Sample locality

FIGURE D-6.– Surface and underground maps, inset C, Iron Mask mine

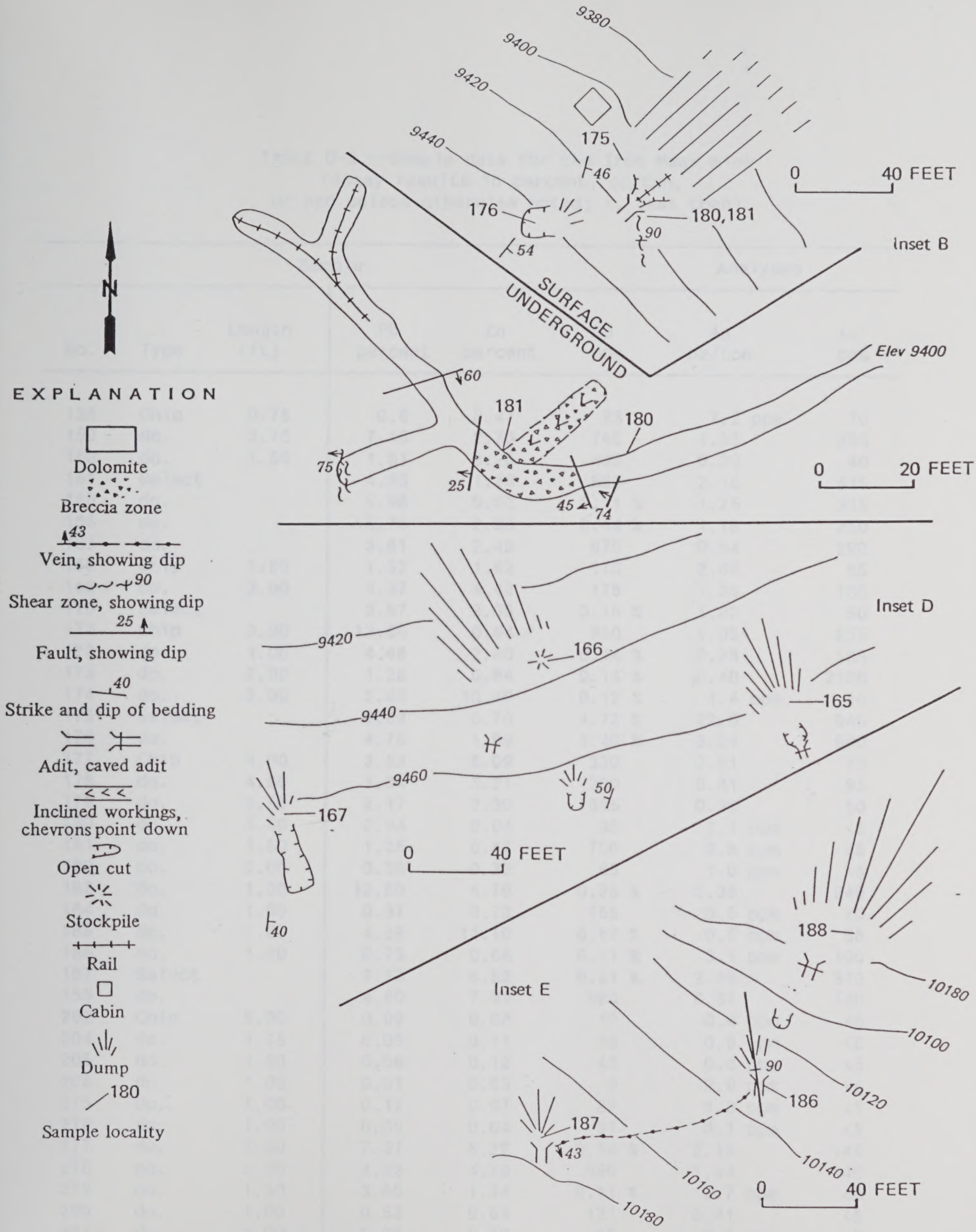

9380
9400
9420
9440
175
46
176
180,181
90
54
0 40 FEET
Inset B
SURFACE
UNDERGROUND
Elev 9400
60
181
180
75
25
45
74
0 20 FEET
EXPLANATION
Dolomite
Breccia zone
43
Vein, showing dip
90
Shear zone, showing dip
25
Fault, showing dip
40
Strike and dip of bedding
Adit, caved adit
Inclined workings, chevrons point down
Open cut
Stockpile
Rail
Cabin
Dump
180
Sample locality
9420
166
165
Inset D
9440
9460
50
167
0 40 FEET
40
Inset E
188
10180
10100
90
10120
186
187
43
10140
10160
10180
0 40 FEET

FIGURE D-7.– Surface and underground maps, inset B, D, and E, Iron Mask mine

TABLE D-2.--Sample data for the Iron Mask mine
(Assay results in percent, oz/ton,
or ppb unless otherwise noted; <, less than)

Sample			Analyses				
No.	Type	Length (ft)	Pb percent	Zn percent	Cu ppm	Ag oz/ton	Au ppb
158	Chip	0.75	0.6	0.47	23	1.2 ppm	70
159	do.	3.75	7.10	2.70	760	1.55	260
160	do.	7.50	1.81	9.20	463	0.29	40
161	Select		4.95	1.26	830	2.10	515
165	do.		8.98	0.82	0.11 %	1.25	315
166	do.		15.70	2.08	0.44 %	1.78	250
167	do.		3.61	2.46	670	0.64	290
168	Chip	1.50	1.52	1.62	170	2.66	65
169	do.	3.00	4.37	4.43	176	1.26	180
170	Select		3.57	3.05	0.16 %	1.02	50
171	Chip	3.00	12.00	0.64	950	1.05	255
172	do.	1.00	4.68	2.40	0.14 %	0.25	185
173	do.	2.00	1.28	0.84	0.14 %	0.40	2100
174	do.	2.00	2.43	10.40	0.12 %	1.4 ppm	10
175	Select		8.66	0.70	4.73 %	22.5	545
176	do.		4.76	1.09	1.40 %	5.54	600
177	Chip	4.00	3.53	6.09	330	0.61	75
178	do.	4.50	1.84	3.21	300	0.41	95
179	do.	2.50	2.17	2.30	365	0.36	50
180	do.	1.50	0.04	0.04	35	1.1 ppm	<5
181	do.	1.50	1.25	0.47	700	3.8 ppm	45
182	do.	2.00	0.36	0.32	85	1.0 ppm	<5
183	do.	1.00	12.50	4.70	0.25 %	2.36	240
184	do.	1.00	0.37	0.73	165	0.5 ppm	<5
185	do.	1.00	4.28	11.10	0.52 %	0.5 ppm	55
186	do.	1.20	0.73	0.64	0.11 %	3.1 ppm	100
187	Select		9.73	8.52	0.51 %	2.86	370
188	do.		4.80	7.91	680	0.61	140
203	Chip	5.00	0.02	0.04	12	0.4 ppm	<5
204	do.	1.75	0.05	0.11	18	0.9 ppm	<5
205	do.	1.90	0.08	0.12	43	0.6 ppm	<5
206	do.	1.00	0.01	0.03	9	0.9 ppm	<5
275	do.	1.00	0.12	0.07	82	1.0 ppm	<5
276	do.	1.00	0.09	0.04	31	0.1 ppm	<5
277	do.	2.00	7.37	8.22	0.14 %	2.19	145
278	do.	2.00	4.62	4.79	650	1.43	145
279	do.	1.50	3.50	1.34	0.11 %	2.7 ppm	40
280	do.	1.00	0.53	0.63	131	0.41	<5
281	do.	2.00	0.09	0.20	65	0.6 ppm	<5

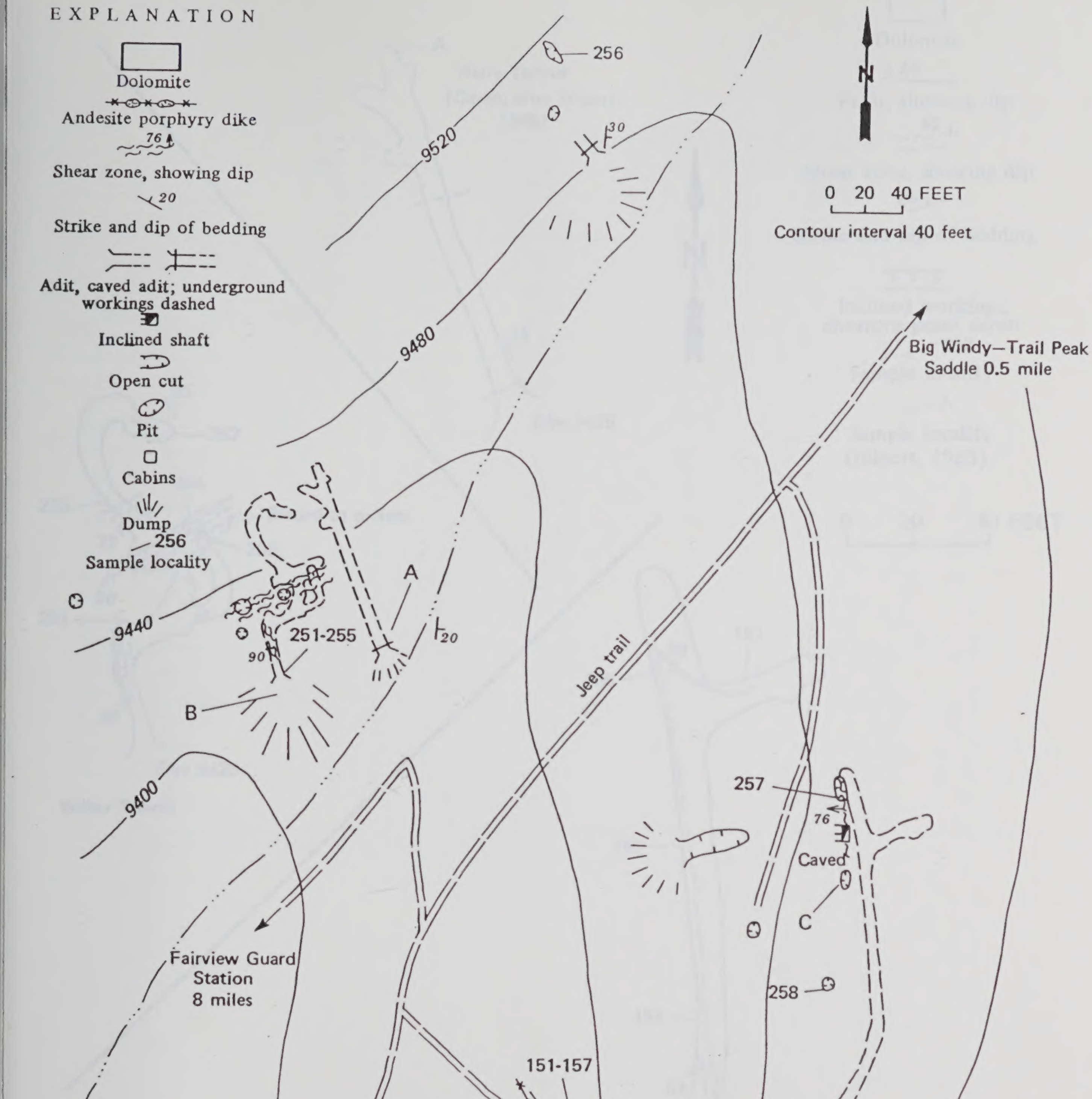

EXPLANATION
Dolomite
Andesite porphyry dike
76
Shear zone, showing dip
20
Strike and dip of bedding
Adit, caved adit; underground workings dashed
Inclined shaft
Open cut
Pit
Cabins
Dump
256
Sample locality
0 20 40 FEET
Contour interval 40 feet
N
256
30
9520
9480
9440
9400
9360
A
B
C
20
90
251-255
Jeep trail
Big Windy—Trail Peak Saddle 0.5 mile
Fairview Guard Station 8 miles
257
76
Caved
258
151-157
Elev 9435

FIGURE D-8.– Surface map, Dividend mine

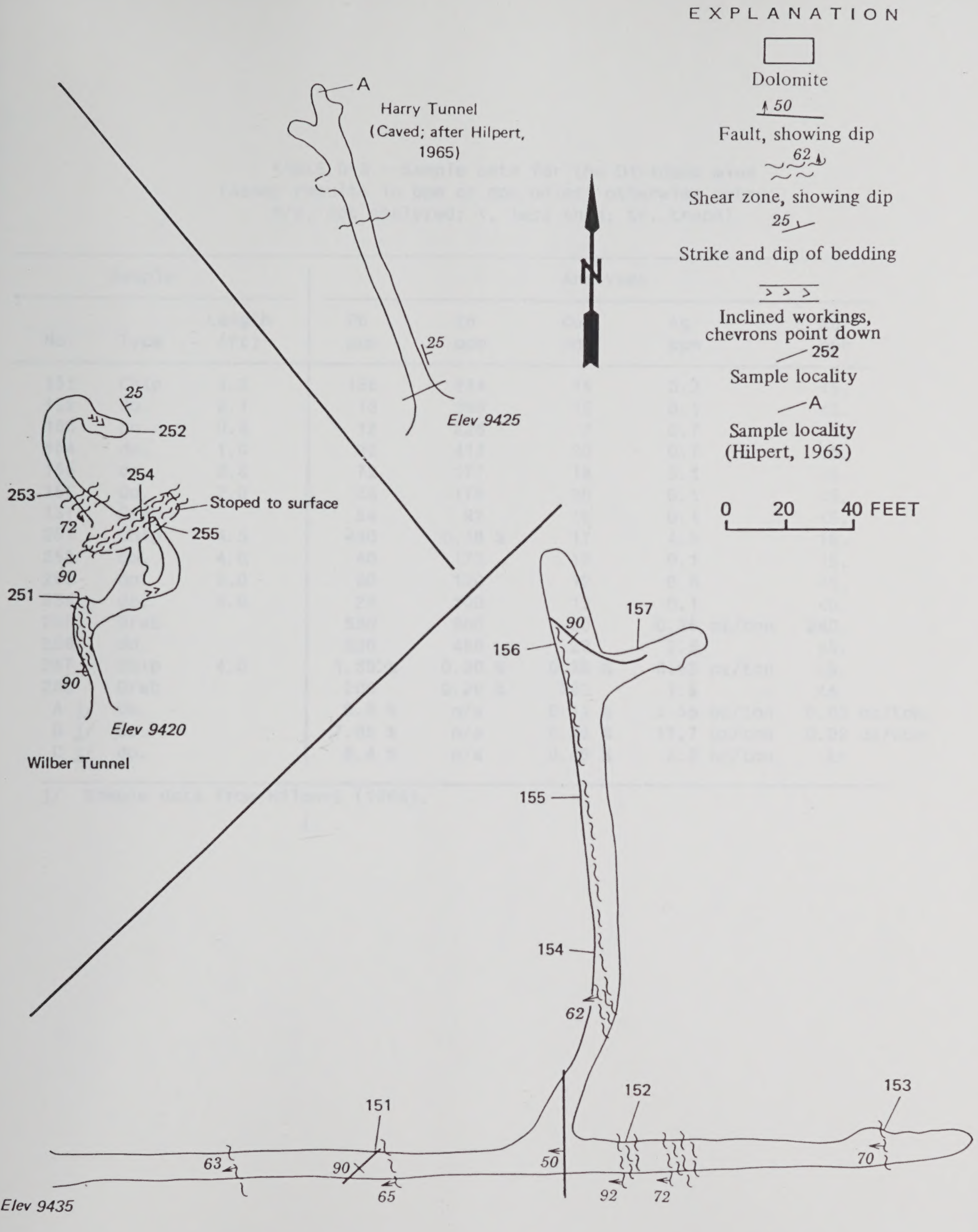

EXPLANATION
Dolomite
50
Fault, showing dip
62
Shear zone, showing dip
25
Strike and dip of bedding
Inclined workings, chevrons point down
252
Sample locality
A
Sample locality (Hilpert, 1965)
0 20 40 FEET
N
A
Harry Tunnel (Caved; after Hilpert, 1965)
25
Elev 9425
25
252
254
253
Stoped to surface
72
255
90
251
90
Elev 9420
Wilber Tunnel
157
90
156
155
154
62
151
152
153
63
90
65
50
92
72
70
Elev 9435

FIGURE D-9.– Underground maps, Dividend mine

TABLE D-3.--Sample data for the Dividend mine
(Assay results in ppm or ppb unless otherwise noted;
n/a, not analyzed; <, less than; tr, trace)

Sample			Analyses				
No.	Type	Length (ft)	Pb ppm	Zn ppm	Cu ppm	Ag ppm	Au ppb
151	Chip	1.2	156	234	15	0.3	<5.
152	do.	2.1	13	390	15	0.1	<5.
153	do.	0.3	12	226	7	0.7	<5.
154	do.	1.0	32	414	20	0.7	<5.
155	do.	2.5	72	177	18	0.1	<5.
156	do.	2.0	65	178	20	0.1	<5.
157	Grab		54	92	18	0.1	<5.
251	Chip	4.5	490	0.18 %	17	4.5	15.
252	do.	4.0	40	172	12	0.1	<5.
253	do.	2.0	90	120	12	0.6	<5.
254	do.	4.0	26	100	12	0.1	<5.
255	Grab		530	960	20	0.36 oz/ton	240.
256	do.		630	488	23	2.5	<5.
257	Chip	4.0	1.39 %	0.30 %	0.38 %	0.53 oz/ton	<5.
258	Grab		200	0.29 %	392	1.8	<5.
A 1/	do.		0.3 %	n/a	0.13 %	2.55 oz/ton	0.03 oz/ton
B 1/	do.		7.05 %	n/a	0.15 %	17.7 oz/ton	0.02 oz/ton
C 1/	do.		8.4 %	n/a	0.48 %	2.3 oz/ton	tr

1/ Sample data from Hilpert (1965).

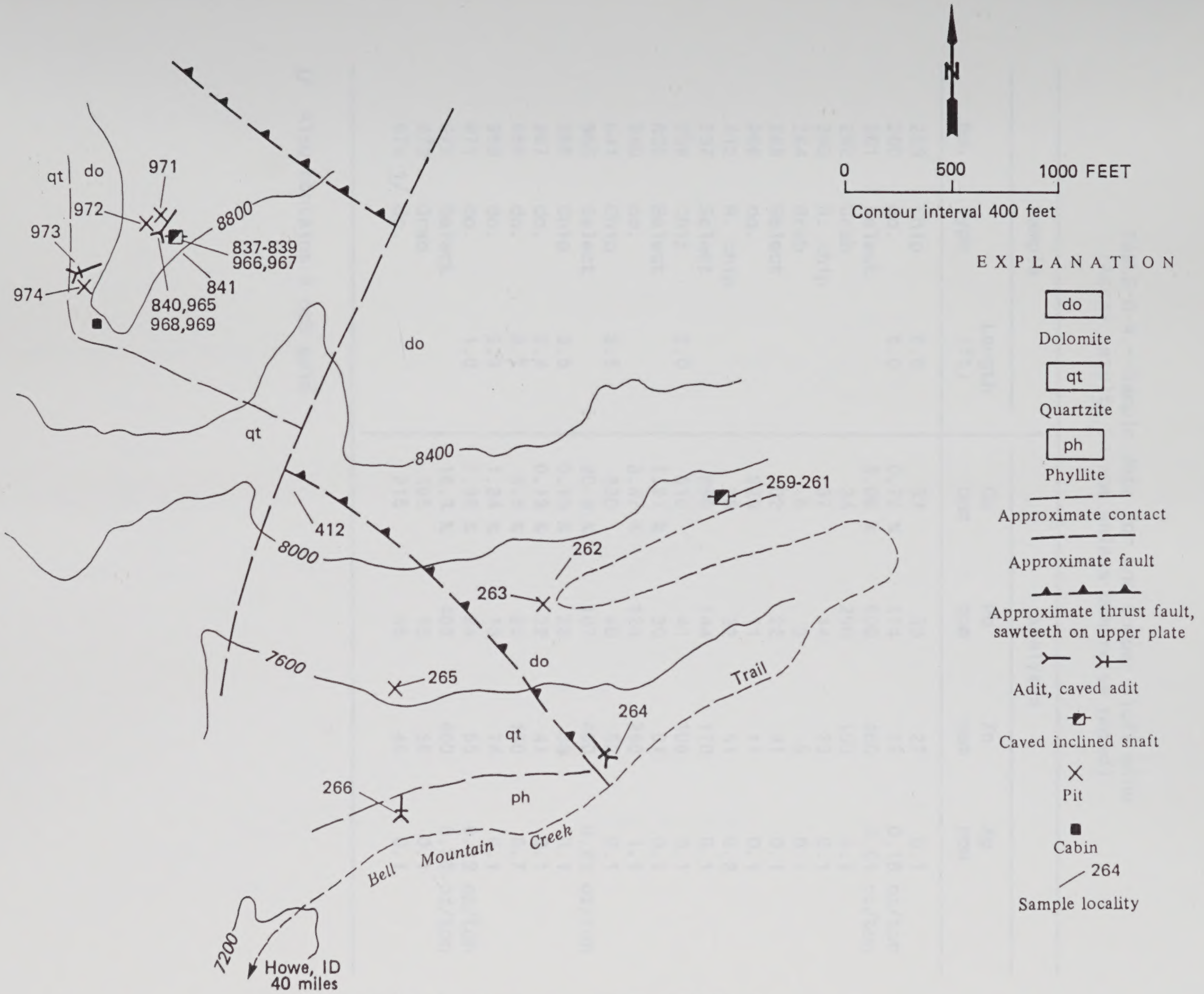

N
0
500
1000 FEET
Contour interval 400 feet
EXPLANATION
do
Dolomite
qt
Quartzite
ph
Phyllite
Approximate contact
Approximate fault
Approximate thrust fault, sawteeth on upper plate
Adit, caved adit
Caved inclined snaft
Pit
Cabin
264
Sample locality
qt
do
971
972
973
974
837-839
966,967
841
840,965
968,969
8800
8400
8000
7600
7200
do
qt
412
262
263
259-261
265
do
264
qt
266
ph
Trail
Bell Mountain Creek
Howe, ID
40 miles

FIGURE D-10.– Surface map, Copper Bluff mine

TABLE D-4.--Sample data for the Copper Bluff mine
(Assay results in ppm unless otherwise noted)

Sample			Analyses			
No.	Type	Length (ft)	Cu ppm	Pb ppm	Zn ppm	Ag ppm
259	Chip	6.0	93	33	27	0.1
260	do.	6.0	0.72 %	174	22	0.18 oz/ton
261	Select		5.08 %	600	480	0.61 oz/ton
262	Grab		34	290	109	0.1
263	R. chip		37	14	23	0.1
264	Grab		5	3	9	0.1
265	Select		102	22	31	0.1
266	do.		220	11	11	0.1
412	R. chip		15	32	51	0.2
837	Select		255	144	170	0.1
838	Chip	2.0	515	41	108	0.1
839	Select		1.91 %	30	61	0.1
840	do.		3.47 %	124	250	1.1
841	Chip	2.5	630	40	52	0.1
965	Select		20.8 %	187	400	0.23 oz/ton
966	Chip	3.5	0.10 %	28	38	0.1
967	do.	2.4	0.13 %	22	41	0.1
968	do.	2.7	3.6 %	26	150	0.7
969	do.	2.3	1.24 %	13	74	0.1
971	do.	1.0	7.98 %	24	55	0.12 oz/ton
972	Select		16.3 %	465	460	0.28 oz/ton
973	Grab		495	18	35	0.1
974 1/	do.		215	46	46	0.1

1/ Also contains 5 ppb gold

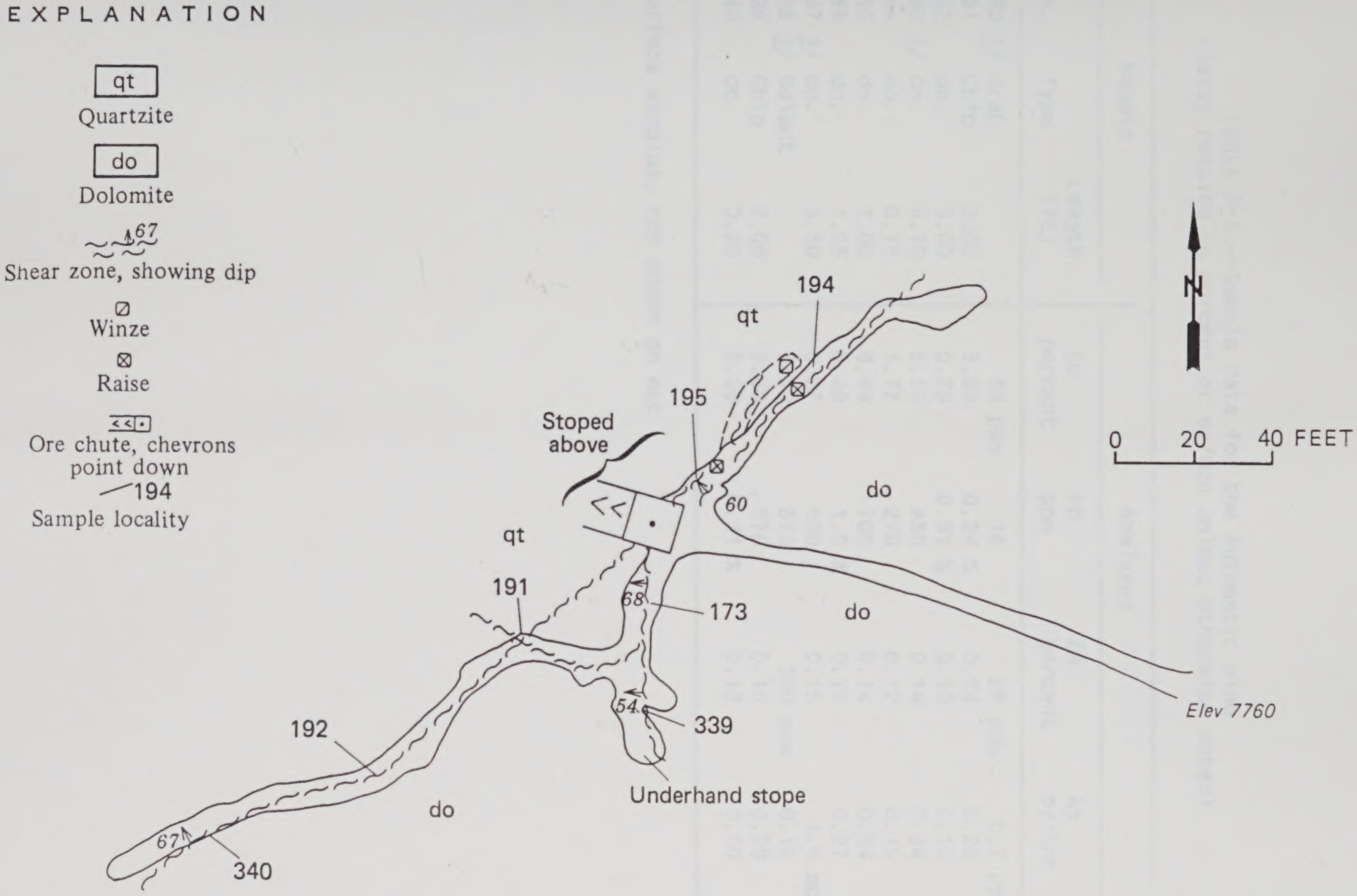

EXPLANATION
qt
Quartzite
do
Dolomite
67
Shear zone, showing dip
Winze
Raise
Ore chute, chevrons point down
194
Sample locality
194
qt
195
Stoped above
60
do
qt
191
68
173
do
54
339
Underhand stope
192
do
67
340
Elev 7760
N
0
20
40 FEET

FIGURE D-11.– Underground map, Automatic mine

TABLE D-5.--Sample data for the Automatic mine
(Assay results in percent or oz/ton unless otherwise noted)

Sample			Analyses			
No.	Type	Length (ft)	Cu percent	Pb ppm	Zn percent	Ag oz/ton
190 1/	Grab		59 ppm	16	28 ppm	0.7 ppm
191	Chip	3.00	3.39	0.24 %	0.24	0.28
192	do.	3.00	0.79	0.31 %	0.19	0.12
193 1/	do.	0.70	6.52	450	0.14	0.34
194	do.	0.75	1.77	270	0.12	0.15
195	do.	1.00	6.89	700	0.14	0.34
196	do.	1.25	0.49	1.0 %	0.12	0.27
197 1/	do.	4.50	0.27	630	0.15	1.6 ppm
338 1/	Select		1.10	670	360 ppm	0.12
339	Chip	2.00	3.30	670	0.18	0.29
340	do.	0.20	5.39	0.11 %	0.13	0.50

1/ Surface samples; not shown on map

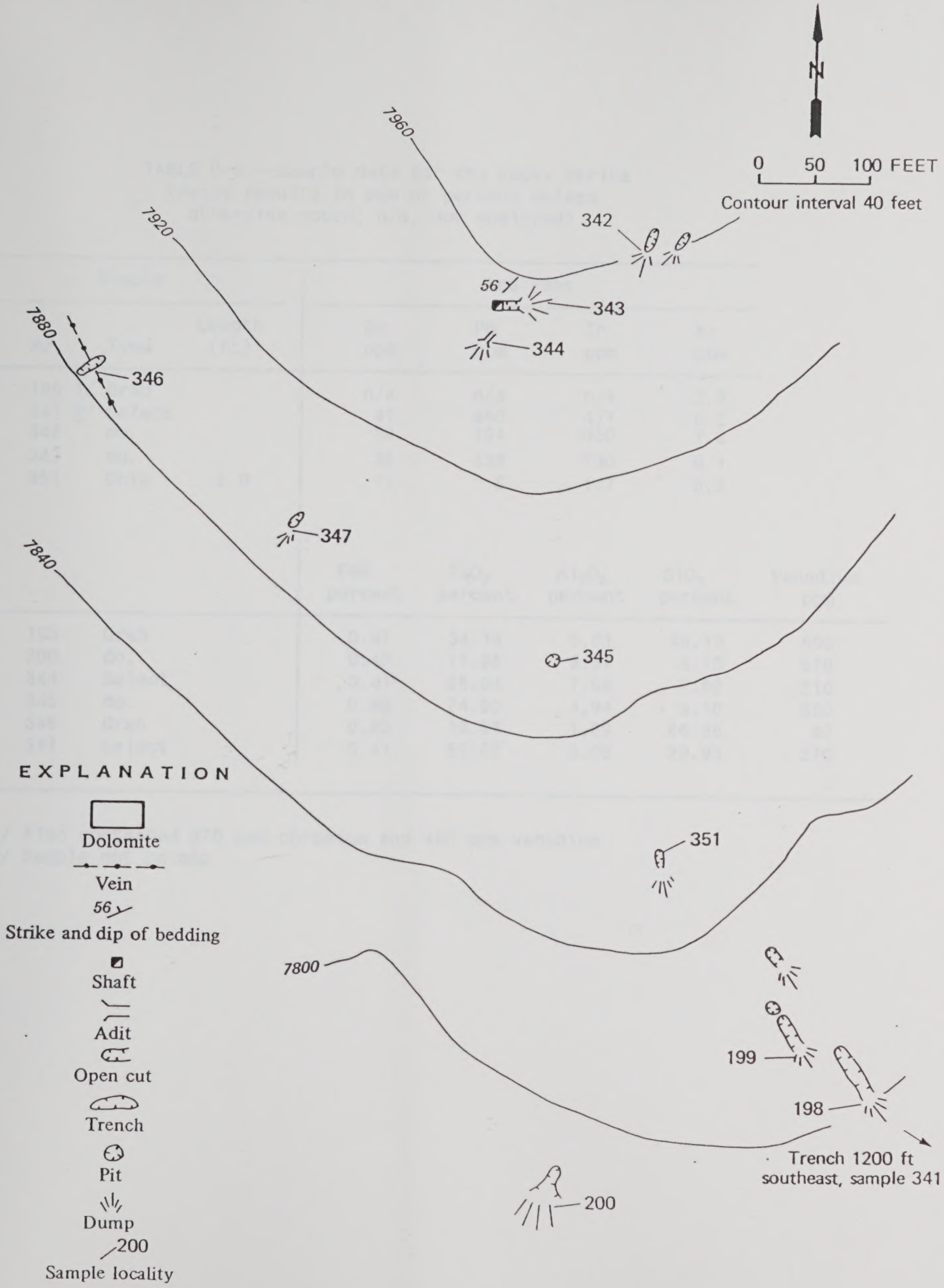
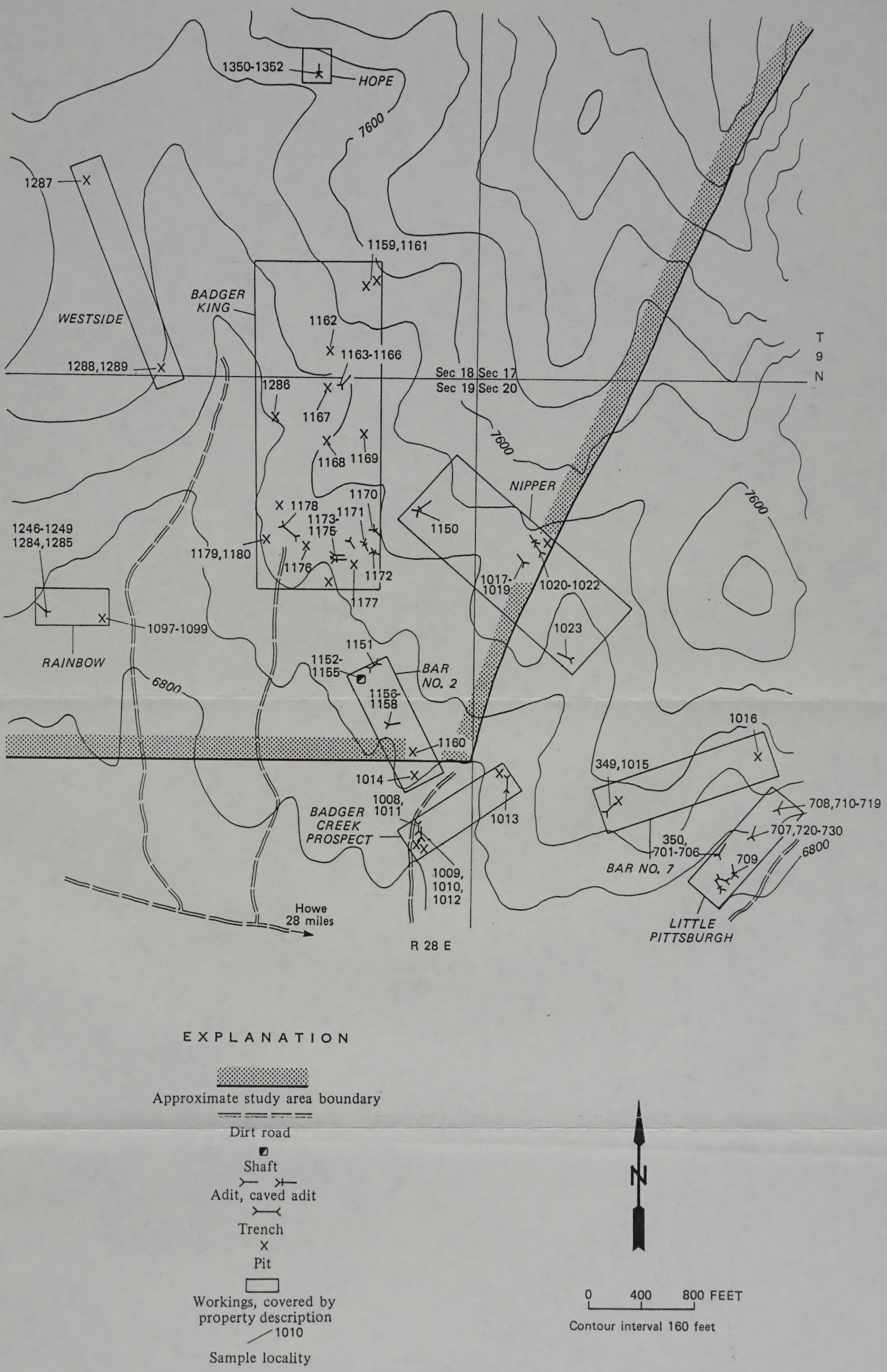

N
0 50 100 FEET
Contour interval 40 feet
7960
7920
7880
7840
7800
342
56
343
344
346
347
345
351
199
198
Trench 1200 ft southeast, sample 341
200
EXPLANATION
Dolomite
Vein
56
Strike and dip of bedding
Shaft
Adit
Open cut
Trench
Pit
Dump
200
Sample locality

FIGURE D-12. – Surface map, Lucky Strike prospect

TABLE D-6.--Sample data for the Lucky Strike
(Assay results in ppm or percent unless
otherwise noted; n/a, not analyzed)

Sample			Analyses				
No.	Type	Length (ft)	Cu ppm	Pb ppm	Zn ppm	Ag ppm	
199 1/	Grab		n/a	n/a	n/a	2.8	
341 2/	Select		41	350	477	0.2	
342	do.		59	194	950	1.2	
343	do.		35	138	730	0.1	
351	Chip	2.0	11	5	117	0.3	
			FeO percent	FeO_2 percent	Al_2O_3 percent	SiO_2 percent	Vanadium ppm
198	Grab		0.47	34.14	5.01	49.13	500
200	do.		0.40	75.95	3.37	3.70	670
344	Select		0.41	55.04	7.08	7.82	210
345	do.		0.80	74.92	4.94	9.10	390
346	Grab		0.25	19.91	1.09	66.36	40
347	Select		0.41	53.52	3.08	29.93	270

1/ Also contained 370 ppm chromium and 460 ppm vanadium
2/ Sample not on map



1350-1352
HOPE
7600
1287
1159,1161
BADGER KING
WESTSIDE
1162
1163-1166
1288,1289
1286
Sec 18
Sec 17
Sec 19
Sec 20
T 9 N
1167
7600
1168
1169
NIPPER
1170
1178
1173-1175
1171
1150
1246-1249
1284,1285
1179,1180
1176
1172
1017-1019
1020-1022
1177
1097-1099
1023
RAINBOW
1151
1152-1155
BAR NO. 2
6800
1156-1158
1016
1160
349,1015
1014
1013
708,710-719
BADGER CREEK PROSPECT
1008, 1011
707,720-730
350, 701-706
6800
709
BAR NO. 7
1009, 1010, 1012
Howe 28 miles
LITTLE PITTSBURGH
R 28 E
EXPLANATION
Approximate study area boundary
Dirt road
Shaft
Adit, caved adit
Trench
Pit
Workings, covered by property description
1010
Sample locality
N
0
400
800 FEET
Contour interval 160 feet

FIGURE D-13.— Surface map, Badger Creek area

TABLE D-7.--Sample data for the Badger Creek area in fig. D-13
(Assay results in ppm unless otherwise noted)

Sample				Analyses			
No.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
1350	Hope	Chip	4.5	0.11 %	25	1.1	50
1351	do.	do.	1.5	137	4	0.1	9
1352	do.	Select		60	105	0.4	16
1287	Westside	do.		11	374	0.6	18
1288 1/	do.	R. chip		90	0.47 %	1.1	71
1289 2/	do.	do.		128	35	0.16 oz/ton	21
1159	Badger King	Select		31	22	0.1	8
1161	do.	Grab		70	27	0.3	13
1162	do.	Select		0.25 %	0.35 %	0.23 oz/ton	138
1163	do.	Chip	3.0	70	35	0.5	6
1164	do.	do.	3.0	81	0.15 %	0.2	61
1165	do.	do.	2.5	60	710	0.1	68
1166	do.	do.	3.3	415	0.36 %	0.4	58
1167	do.	do.	1.3	228	0.46 %	0.3	52
1168	do.	Select		0.14 %	0.74 %	0.23 oz/ton	125
1169	do.	do.		1.52 %	0.13 %	3.5 oz/ton	0.84 %
1170	do.	do.		0.18 %	0.16 %	2.4	443
1171	do.	Chip	4.0	0.19 %	355	0.13 oz/ton	162
1172	do.	Select		0.13 %	0.24 %	0.14 oz/ton	2.16 %
1173	do.	Chip	1.5	50	33	0.6	61
1174	do.	do.	5.0	52	40	0.7	25
1175 3/	do.	do.	4.0	23	25	0.4	8
1176 4/	do.	R. Chip		0.18 %	910	0.11 oz/ton	195
1177	do.	Select		384	120	1.2	38
1178	do.	R. Chip		0.28 %	1.18 %	0.32 oz/ton	700
1179	do.	Chip	4.0	0.38 %	287	0.42 oz/ton	330
1180	do.	do.	6.0	0.34 %	0.15 %	0.96 oz/ton	0.25 %
1286	do.	do.	1.3	69	0.28 %	0.1	9
1097	Rainbow	Grab		0.22 %	24	0.3	88
1098	do.	do.		49	86	0.1	73
1099	do.	do.		33	11	0.1	85
1246	do.	Chip	3.0	404	0.32 %	0.7	70
1247	do.	do.	2.5	37	251	0.1	71
1248	do.	do.	3.4	241	0.32 %	0.9	112
1249	do.	do.	2.6	118	930	0.1	21
1284	do.	do.	3.5	398	0.18 %	0.8	41
1285	do.	do.	4.0	17	463	0.1	14

TABLE D-7.--Sample data for the Badger Creek area in fig. D-13--Continued

Sample				Analyses			
No.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
1014 5/	Bar No. 2	Chip	1.5	1.64 %	165	3.56 oz/ton	0.35 %
1151	do.	Select		500	750	1.1	94
1152	do.	Chip	4.0	0.43 %	114	0.70 oz/ton	225
1153	do.	do.	2.0	0.20 %	112	0.31 oz/ton	69
1154	do.	do.	4.0	0.19 %	500	0.23 oz/ton	462
1155	do.	do.	2.5	700	340	3.9	182
1156	do.	do.	4.2	112	41	1.6	80
1157	do.	do.	1.5	0.17 %	610	5.4	68
1158	do.	do.	6.0	238	234	2.1	30
1160	do.	Select		133	88	1.6	31
1017	Nipper	Chip	5.0	445	245	2.2	128
1018 5/	do.	do.	5.0	325	195	1.2	35
1019 6/	do.	do.	5.0	680	135	0.8	31
1020	do.	do.	7.0	438	38	0.5	79
1021	do.	do.	2.5	0.17 %	17	5.2	117
1022 6/	do.	do.	6.0	405	34	0.6	81
1023	do.	do.	4.0	94	26	0.7	128
1150	do.	R. chip		0.18 %	315	2.8	231
349	Bar No. 7	Chip	0.8	46	6	0.1	6
1015 6/	do.	do.	3.5	85	12	2.1	87
1016	do.	Select		380	52	0.6	58
1008	Badger Creek	do.		140	0.15 %	4.02 oz/ton	2.07 %
1009 5/	do.	Chip	4.5	38	250	1.2	100
1010	do.	do.	4.5	36	250	1.5	78
1011 5/	do.	Select		26	410	2.1	160
1012 5/	do.	do.		800	0.31 %	6.27 oz/ton	3.72 %
1013	do.	do.		0.43 %	780	17.2 oz/ton	1.83 %

1/ Also contains 30 ppb gold
2/ Also contains 20 ppb gold
3/ Also contains 45 ppb gold
4/ Also contains 15 ppb gold
5/ Also contains 5 ppb gold
6/ Also contains 10 ppb gold

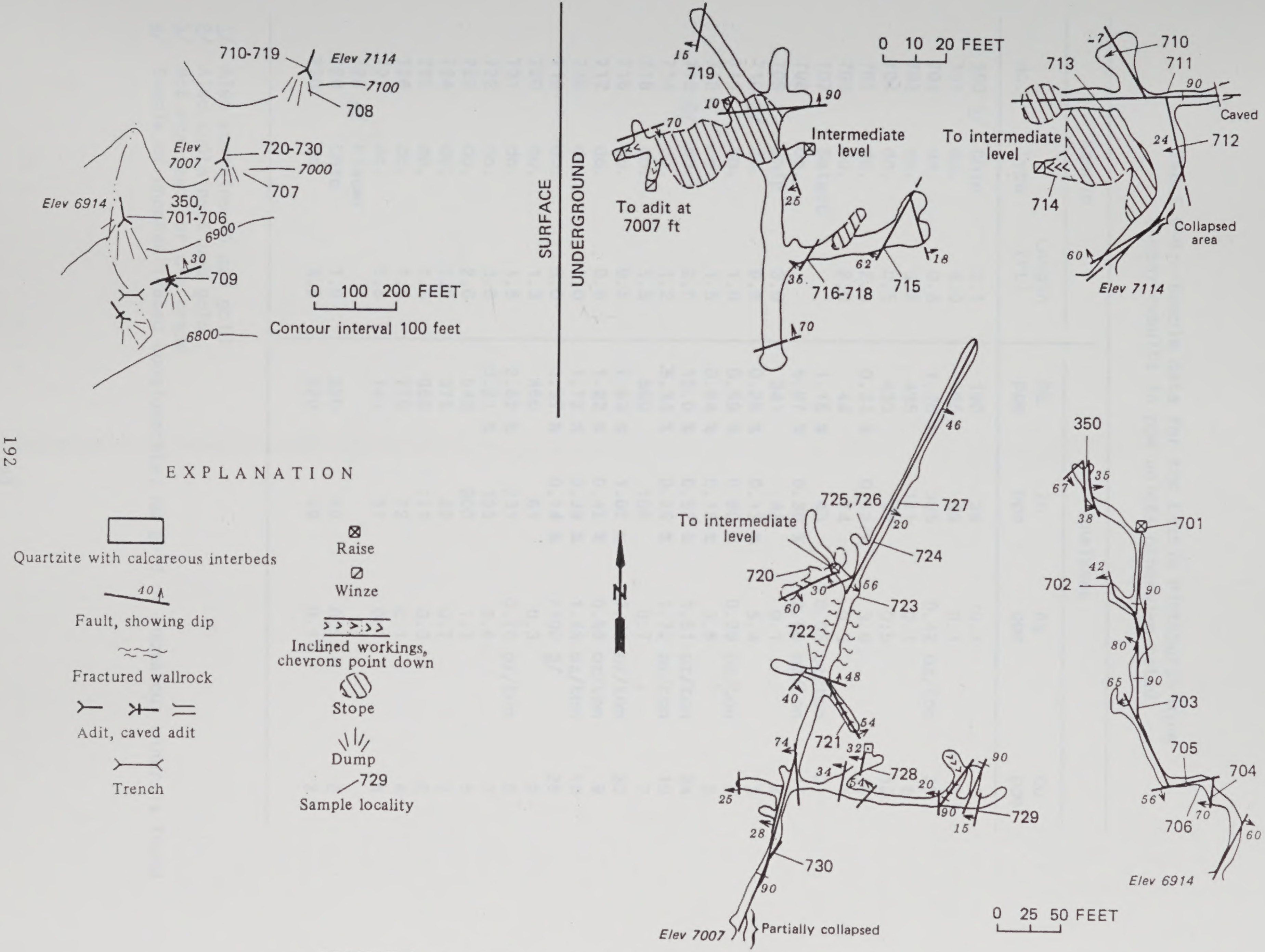

710-719
Elev 7114
7100
708
Elev 7007
720-730
7000
707
Elev 6914
350,
701-706
6900
30
709
0 100 200 FEET
Contour interval 100 feet
6800
SURFACE
UNDERGROUND
15
719
10
90
70
Intermediate level
To adit at 7007 ft
25
35
62
18
716-718
715
70
0 10 20 FEET
7
710
711
713
90
Caved
To intermediate level
24
712
714
Collapsed area
60
Elev 7114
46
350
35
67
38
701
725,726
727
20
To intermediate level
724
720
56
30
60
723
42
702
90
722
80
48
40
65
90
703
54
74
721
32
728
34
54
20
90
705
704
25
90
15
729
56
70
706
60
28
730
90
Elev 6914
Elev 7007
Partially collapsed
0 25 50 FEET
EXPLANATION
Quartzite with calcareous interbeds
40
Fault, showing dip
Fractured wallrock
Adit, caved adit
Trench
Raise
Winze
Inclined workings, chevrons point down
Stope
Dump
729
Sample locality
N

FIGURE D-14.– Surface and underground maps, Little Pittsburgh mine

TABLE D-8.--Sample data for the Little Pittsburgh mine
(Assay results in ppm unless otherwise noted)

Sample			Analyses			
No.	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
350 1/	Chip	2.1	190	36	0.1	5
701	do.	4.0	195	39	0.1	3
702	do.	0.8	1.25 %	305	0.42 oz/ton	28
703	do.	3.5	495	111	0.1	6
704	do.	0.5	430	91	0.5	12
705	do.	2.0	0.34 %	0.12 %	3.9	16
706	do.	2.0	44	74	0.3	7
707	Select		1.15 %	43	0.93 oz/ton	21
708	do.		6.97 %	0.36 %	2.60 oz/ton	12
709	Chip	3.0	341	43	0.1	4
710 1/	do.	0.8	0.26 %	0.13 %	5.4	3
711	do.	1.0	0.59 %	0.80 %	0.29 oz/ton	6
712	do.	1.5	0.84 %	0.13 %	3.6	3
713 2/	do.	2.0	15.0 %	0.92 %	1.81 oz/ton	24
714	do.	1.2	5.34 %	0.29 %	1.72 oz/ton	19
715	do.	1.8	660	106	0.7	7
716	do.	0.5	7.63 %	1.02 %	1.40 oz/ton	23
717	do.	0.6	1.22 %	0.42 %	0.56 oz/ton	9
718	do.	2.0	1.72 %	0.39 %	1.43 oz/ton	10
719	do.	3.0	3.37 %	0.14 %	>100 3/	26
720	do.	1.3	460	61	0.3	2
721	do.	1.5	2.62 %	231	0.76 oz/ton	6
722	do.	3.0	0.21 %	165	3.6	7
723	do.	2.0	540	300	1.1	6
724	do.	1.0	375	42	0.7	3
725	do.	1.5	950	111	0.3	8
726	do.	1.5	770	72	0.1	4
727	do.	2.5	145	31	0.1	4
728 4/	Placer					
729	Chip	1.0	220	48	0.3	2
730	do.	3.0	820	49	0.1	2

1/ Also contains 10 ppb gold
2/ Also contains 5 ppb gold
3/ Not analyzed for ore grade
4/ Sample of unconsolidated conglomerate; no gold or anomalous minerals found

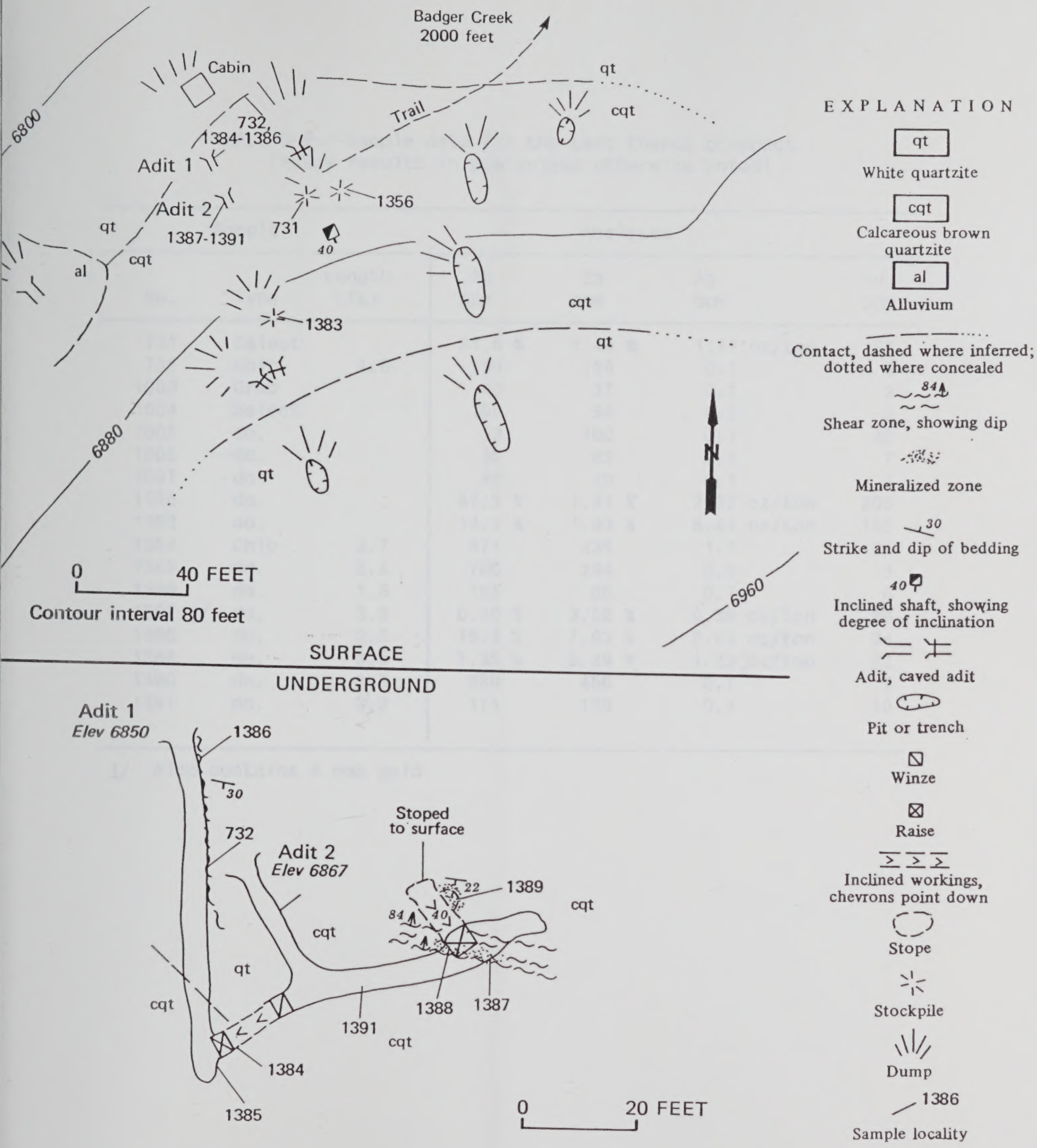

Badger Creek
2000 feet
Cabin
qt
cqt
Trail
732,
1384-1386
Adit 1
Adit 2
1356
731
1387-1391
40
al
1383
6800
6880
6960
0
40 FEET
Contour interval 80 feet
SURFACE
UNDERGROUND
Adit 1
Elev 6850
1386
30
732
Adit 2
Elev 6867
Stoped
to surface
22
1389
84
40
1388
1387
1391
1384
1385
0
20 FEET
EXPLANATION
White quartzite
Calcareous brown quartzite
Alluvium
Contact, dashed where inferred; dotted where concealed
Shear zone, showing dip
Mineralized zone
Strike and dip of bedding
Inclined shaft, showing degree of inclination
Adit, caved adit
Pit or trench
Winze
Raise
Inclined workings, chevrons point down
Stope
Stockpile
Dump
Sample locality

FIGURE D-15.– Surface and underground maps, Last Chance prospect

TABLE D-9.--Sample data for the Last Chance prospect
(Assay results in ppm unless otherwise noted)

Sample			Analyses			
No.	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
731	Select		31.6 %	1.44 %	1.11 oz/ton	56
732	Chip	1.0	290	126	0.1	3
1003	Grab		40	37	0.1	3
1004	Select		105	54	0.3	3
1005	do.		10	100	0.1	48
1006	do.		36	82	0.1	7
1007	do.		28	10	0.1	1
1356	do.		57.2 %	1.91 %	2.37 oz/ton	205
1383	do.		14.3 %	7.93 %	8.44 oz/ton	168
1384	Chip	3.7	471	239	1.7	31
1385	do.	2.5	700	294	0.6	9
1386	do.	1.5	105	80	0.1	6
1387 1/	do.	3.8	0.20 %	3.52 %	0.36 oz/ton	20
1388	do.	2.5	15.6 %	7.63 %	2.63 oz/ton	34
1389	do.	3.5	7.35 %	5.29 %	1.23 oz/ton	32
1390	do.	3.5	880	450	0.7	7
1391	do.	3.3	171	136	0.4	10

1/ Also contains 5 ppb gold

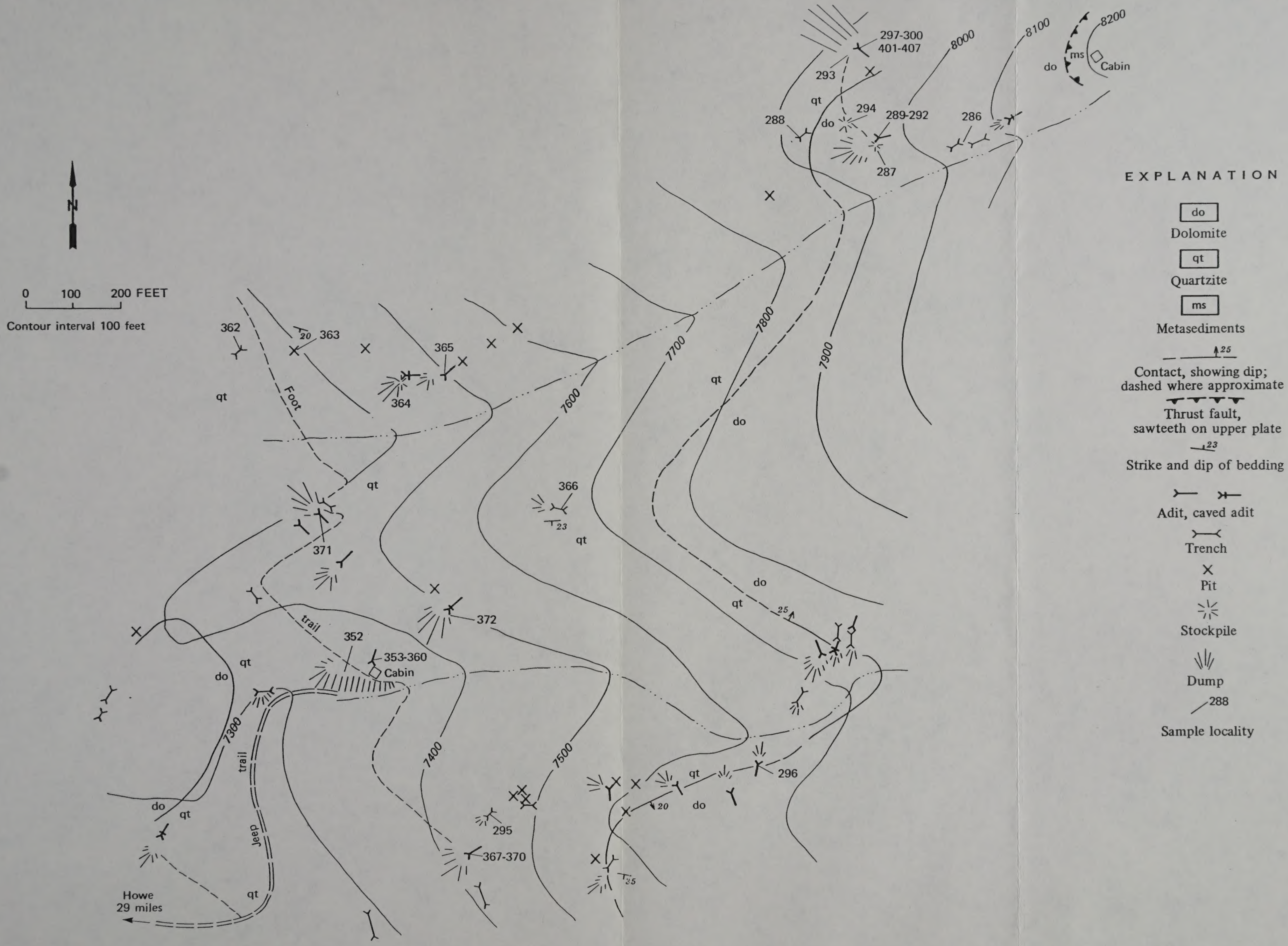

N
0
100
200 FEET
Contour interval 100 feet
297-300
401-407
293
qt
294
do
288
289-292
287
286
8000
8100
8200
do
ms
Cabin
362
20
363
365
364
qt
Foot
qt
7700
7600
7800
7900
qt
do
366
23
qt
371
372
trail
352
353-360
Cabin
qt
do
do
qt
25
7300
7400
7500
trail
Jeep
qt
Howe
29 miles
295
367-370
qt
296
20
do
35
EXPLANATION
do
Dolomite
qt
Quartzite
ms
Metasediments
25
Contact, showing dip;
dashed where approximate
Thrust fault,
sawteeth on upper plate
23
Strike and dip of bedding
Adit, caved adit
Trench
Pit
Stockpile
Dump
288
Sample locality

FIGURE D-16.– Surface map, Valley View mine

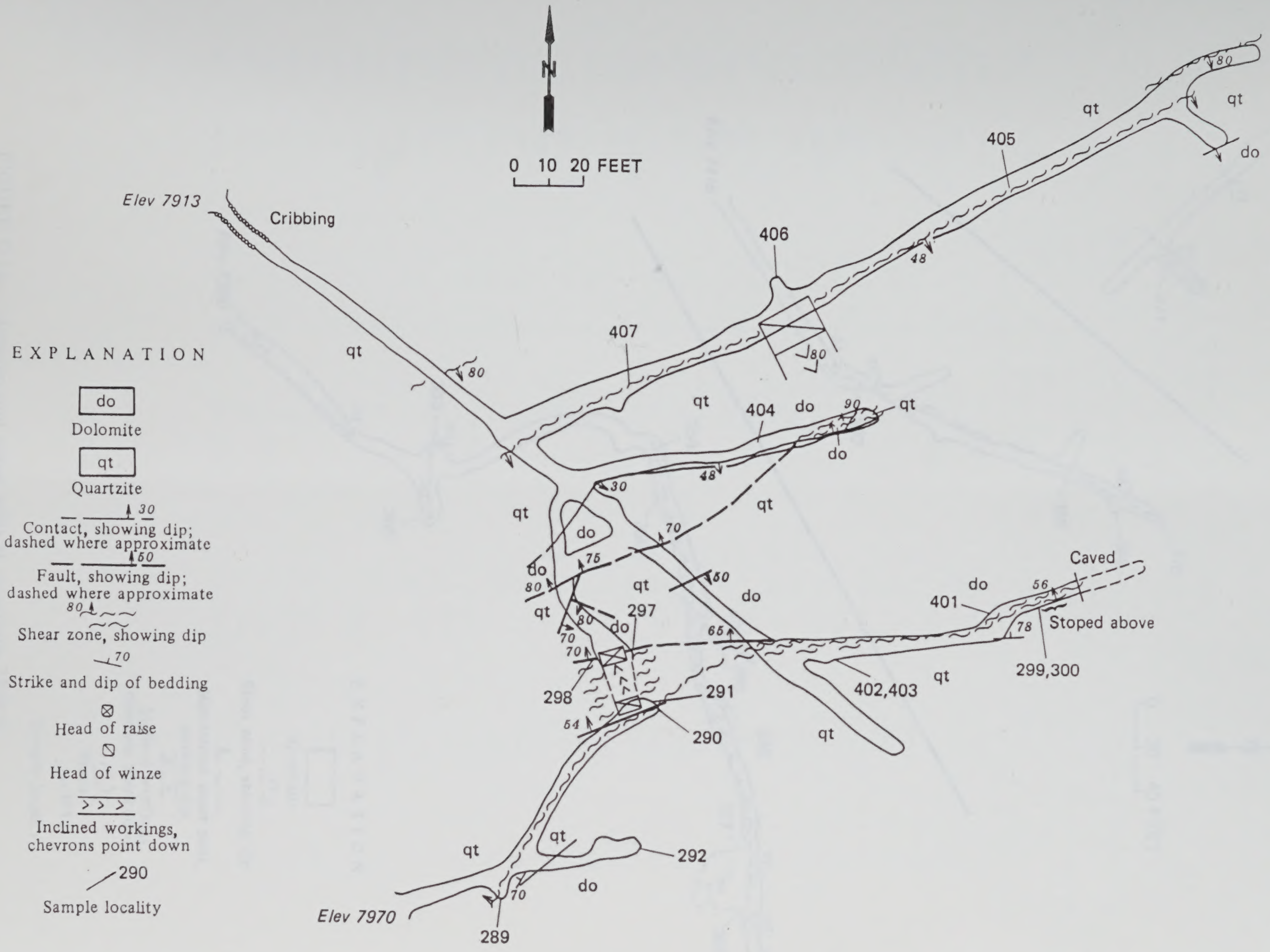

0 10 20 FEET
Elev 7913
Cribbing
qt
405
406
407
404
do
90
qt
do
48
80
30
70
75
80
50
65
56
Caved
401
Stoped above
78
299,300
402,403
297
298
291
290
64
292
289
70
Elev 7970
EXPLANATION
do
Dolomite
qt
Quartzite
30
Contact, showing dip; dashed where approximate
50
Fault, showing dip; dashed where approximate
80
Shear zone, showing dip
70
Strike and dip of bedding
Head of raise
Head of winze
Inclined workings, chevrons point down
290
Sample locality

FIGURE D-17.– Underground map, adit at elevation 7970 ft, Valley View mine

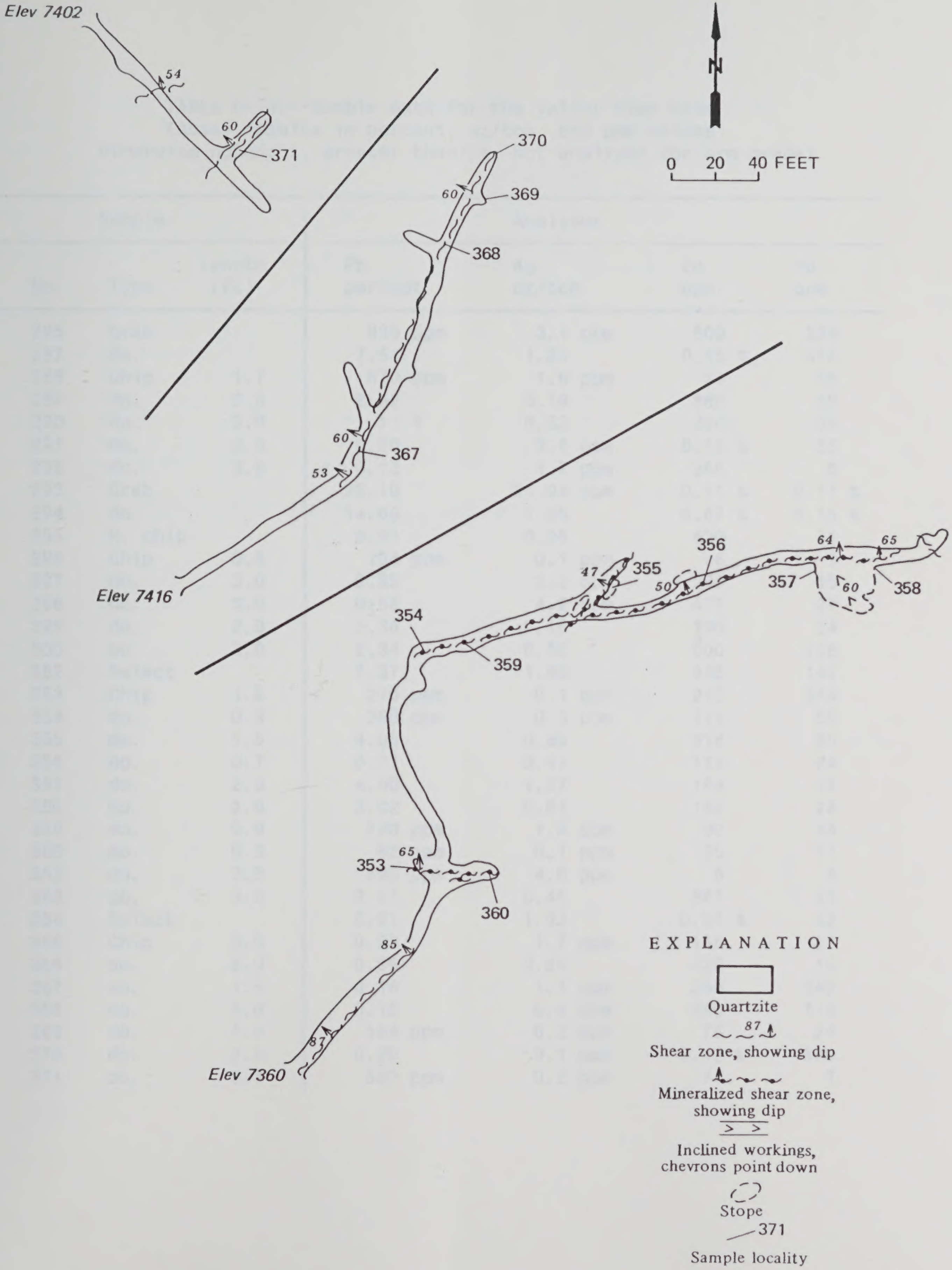

Elev 7402
54
60
371
370
0 20 40 FEET
N
60
369
368
60
367
53
Elev 7416
355
47
356
64
65
50
357
60
358
354
359
65
353
360
85
87
Elev 7360
EXPLANATION
Quartzite
87
Shear zone, showing dip
Mineralized shear zone, showing dip
> >
Inclined workings, chevrons point down
Stope
371
Sample locality

FIGURE D-18.– Underground maps, adits at elevations 7360 ft, 7402 ft, and 7416 ft, Valley View mine

TABLE D-10.--Sample data for the Valley View mine (Assay results in percent, oz/ton, and ppm unless otherwise noted; >, greater than; *, not analyzed for ore grade)

Sample			Analyses			
No.	Type	Length (ft)	Pb percent	Ag oz/ton	Zn ppm	Cu ppm
286	Grab		930 ppm	3.1 ppm	500	239
287	do.		7.54	1.84	0.55 %	476
288	Chip	1.7	870 ppm	1.6 ppm	66	36
289	do.	0.5	2.42	0.19	380	60
290	do.	3.0	>1 *	0.23	380	35
291	do.	2.0	0.20	3.6 ppm	0.15 %	55
292	do.	3.8	0.12	1.7 ppm	256	6
293	Grab		23.10	21.04 ppm	0.11 %	0.11 %
294	do.		14.60	1.46	0.67 %	0.15 %
295	R. chip		0.91	0.26	420	71
296	Chip	0.5	104 ppm	0.1 ppm	26	7
297	do.	3.0	0.35	3.2 ppm	290	15
298	do.	3.0	0.58	4.2 ppm	475	27
299	do.	2.0	2.36	0.18	190	34
300	do.	3.0	2.34	0.56	900	138
352	Select		7.37	1.99	345	142
353	Chip	1.8	210 ppm	0.1 ppm	213	344
354	do.	0.3	360 ppm	0.3 ppm	111	56
355	do.	1.5	4.06	0.88	318	60
356	do.	0.7	0.77	0.47	112	24
357	do.	2.0	4.90	1.37	164	53
358	do.	2.0	3.02	0.61	165	24
359	do.	0.9	730 ppm	1.8 ppm	90	44
360	do.	0.3	82 ppm	0.1 ppm	25	11
362	do.	3.0	690 ppm	4.0 ppm	8	4
363	do.	3.0	3.61	0.45	381	15
364	Select		5.81	1.93	0.57 %	32
365	Chip	3.0	0.23	1.7 ppm	156	23
366	do.	6.0	0.96	0.25	420	12
367	do.	1.5	0.16	1.1 ppm	560	242
368	do.	3.0	0.15	0.4 ppm	450	115
369	do.	1.0	164 ppm	0.2 ppm	75	24
370	do.	2.2	0.20	0.1 ppm	0.12 %	380
371	do.	3.5	580 ppm	0.2 ppm	74	7

TABLE D-10.--Sample data for the Valley View mine--Continued

Sample			Analyses			
No.	Type	Length (ft)	Pb percent	Ag oz/ton	Zn ppm	Cu ppm
372	Select		4.08	0.5	560	19
401	Chip	1.0	0.24	3.5 ppm	256	20
402	do.	3.0	4.31	0.33	415	36
403	do.	2.0	2.34	0.29	710	48
404	do.	5.0	720 ppm	1.1 ppm	140	16
405	do.	3.5	670 ppm	3.3 ppm	150	114
406	do.	6.0	4.12	1.31	0.12 %	290
407	do.	4.0	4.48	0.85	290	44

Note: All samples contained less than 5 ppb gold

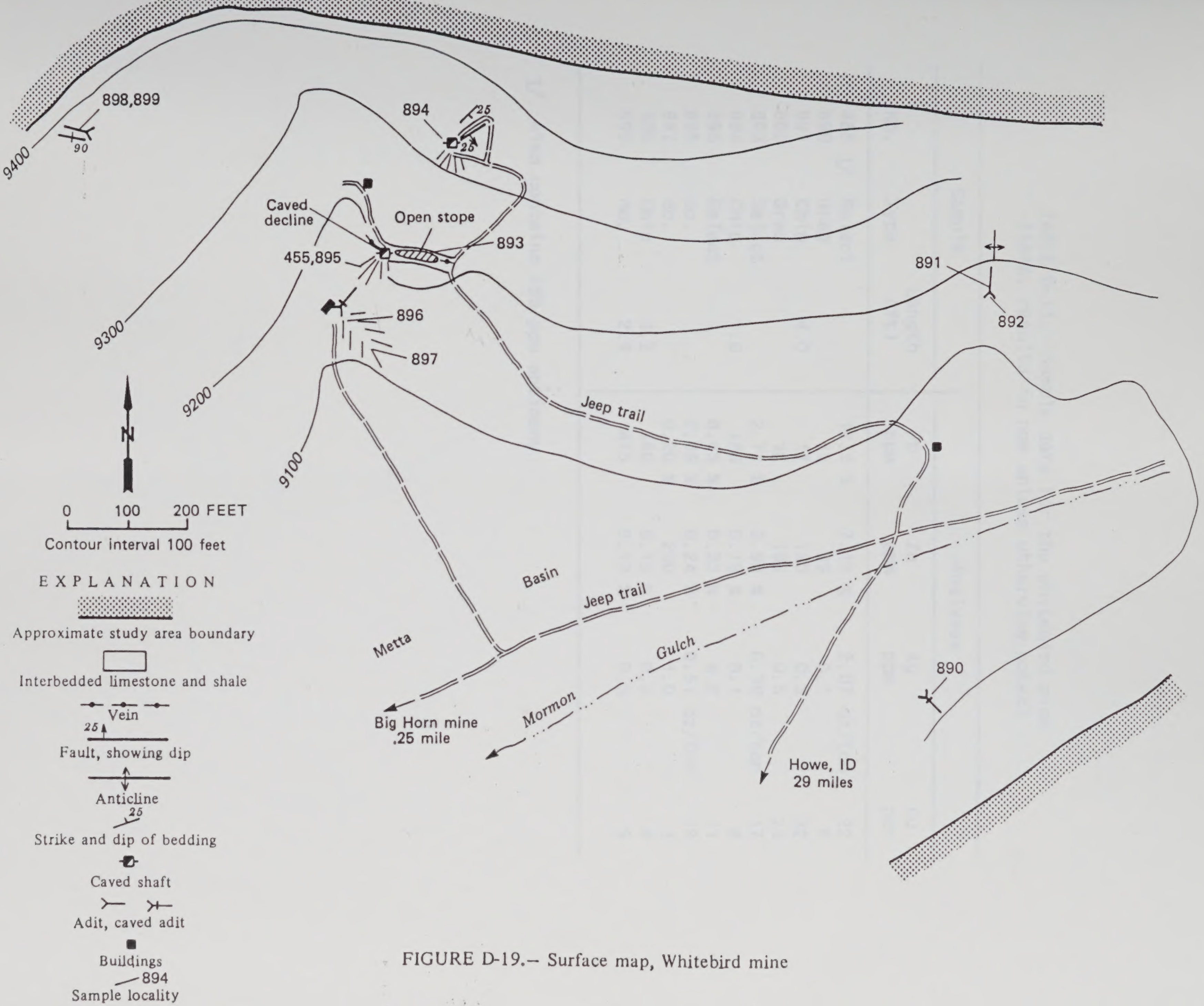

898,899
90
9400
894
25
25
Caved decline
Open stope
893
455,895
891
892
896
897
9300
9200
9100
Jeep trail
Basin
Jeep trail
Metta
Gulch
Mormon
890
Big Horn mine
.25 mile
Howe, ID
29 miles
N
0
100
200 FEET
Contour interval 100 feet
EXPLANATION
Approximate study area boundary
Interbedded limestone and shale
Vein
25
Fault, showing dip
Anticline
25
Strike and dip of bedding
Caved shaft
Adit, caved adit
Buildings
894
Sample locality

FIGURE D-19.– Surface map, Whitebird mine

TABLE D-11.--Sample data for the Whitebird mine
(Assay results in ppm unless otherwise noted)

Sample			Analyses			
No.	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
455 1/	Select		17.9 %	7.16 %	2.07 oz/ton	22
890	Grab		13	39	0.1	9
891	Chip	4.0	17	130	0.3	32
892	Grab		16	165	0.5	29
893	Select		2.71 %	3.99 %	0.39 oz/ton	17
894	Chip	1.0	180	0.13 %	0.1	8
895	Select		0.65 %	0.33 %	4.2	11
896	do.		2.05 %	0.24 %	0.51 oz/ton	19
897	do.		0.20 %	290	1.0	3
898	Chip	3.2	460	0.15 %	0.4	9
899	do.	2.9	475	0.13 %	0.3	9

1/ Also contains 250 ppm antimony

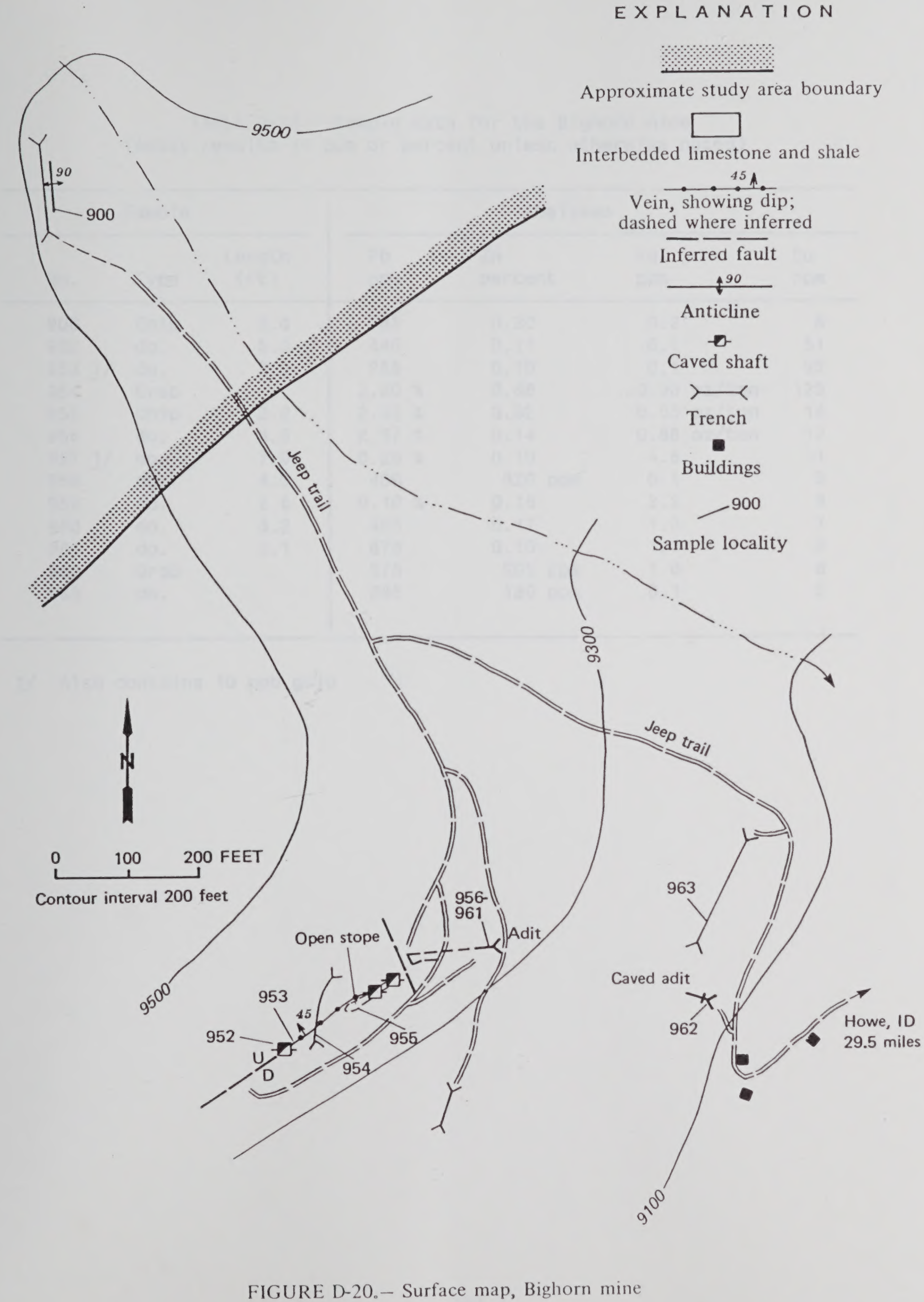

EXPLANATION
Approximate study area boundary
Interbedded limestone and shale
45
Vein, showing dip; dashed where inferred
Inferred fault
90
Anticline
Caved shaft
Trench
Buildings
900
Sample locality
9500
90
900
Jeep trail
9300
Jeep trail
N
0
100
200 FEET
Contour interval 200 feet
956-
961
Adit
Open stope
963
953
45
952
U
D
955
954
9500
Caved adit
962
Howe, ID
29.5 miles
9100

FIGURE D-20.– Surface map, Bighorn mine

TABLE D-12.--Sample data for the Bighorn mine
(Assay results in ppm or percent unless otherwise noted)

Sample			Analyses			
No.	Type	Length (ft)	Pb ppm	Zn percent	Ag ppm	Cu ppm
900	Chip	2.0	185	0.30	0.2	8
952	do.	5.0	440	0.11	0.1	51
953 1/	do.	3.0	255	0.10	0.1	92
954	Grab		3.80 %	0.58	0.90 oz/ton	129
955	Chip	2.2	2.33 %	3.02	0.55 oz/ton	14
956	do.	3.5	2.37 %	0.14	0.88 oz/ton	12
957 1/	do.	7.0	0.26 %	0.10	4.8	11
958	do.	4.0	400	620 ppm	0.1	8
959	do.	2.5	0.10 %	0.16	2.2	9
960	do.	3.2	455	0.17	1.0	7
961	do.	3.1	670	0.10	1.1	5
962	Grab		375	205 ppm	1.0	6
963	do.		295	180 ppm	0.1	5

1/ Also contains 10 ppb gold

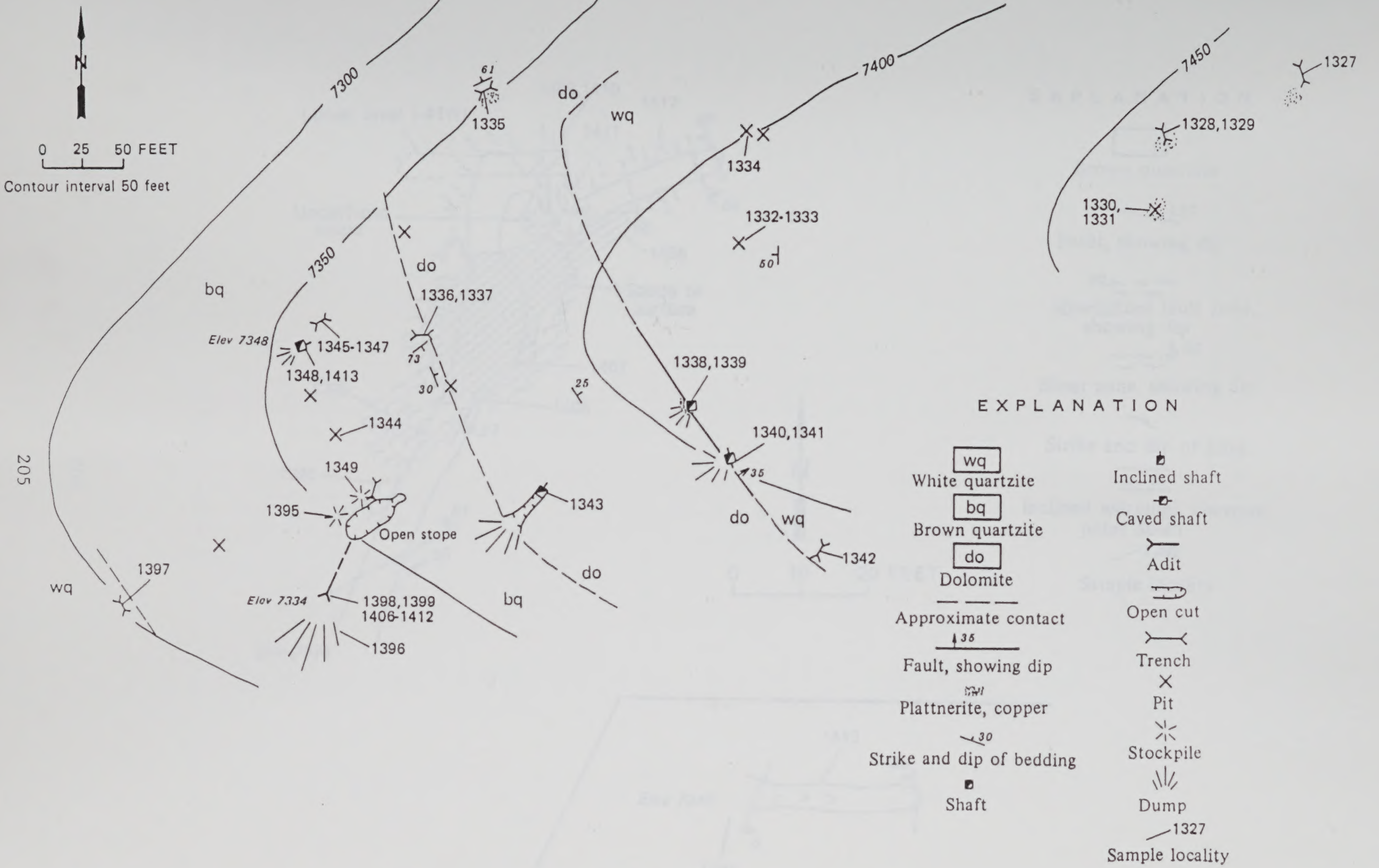

N
0 25 50 FEET
Contour interval 50 feet
7300
7350
7400
7450
61
1335
do
wq
1334
1332-1333
50
1327
1328,1329
1330,
1331
bq
do
1336,1337
Elev 7348
1345-1347
1348,1413
73
30
25
1338,1339
1344
1340,1341
35
1349
1395
Open stope
1343
do
wq
1342
1397
wq
Elev 7334
1398,1399
1406-1412
bq
do
1396
EXPLANATION
wq
White quartzite
bq
Brown quartzite
do
Dolomite
Approximate contact
35
Fault, showing dip
Plattnerite, copper
30
Strike and dip of bedding
Shaft
Inclined shaft
Caved shaft
Adit
Open cut
Trench
Pit
Stockpile
Dump
1327
Sample locality

FIGURE D-21.– Surface map, Lookout mine

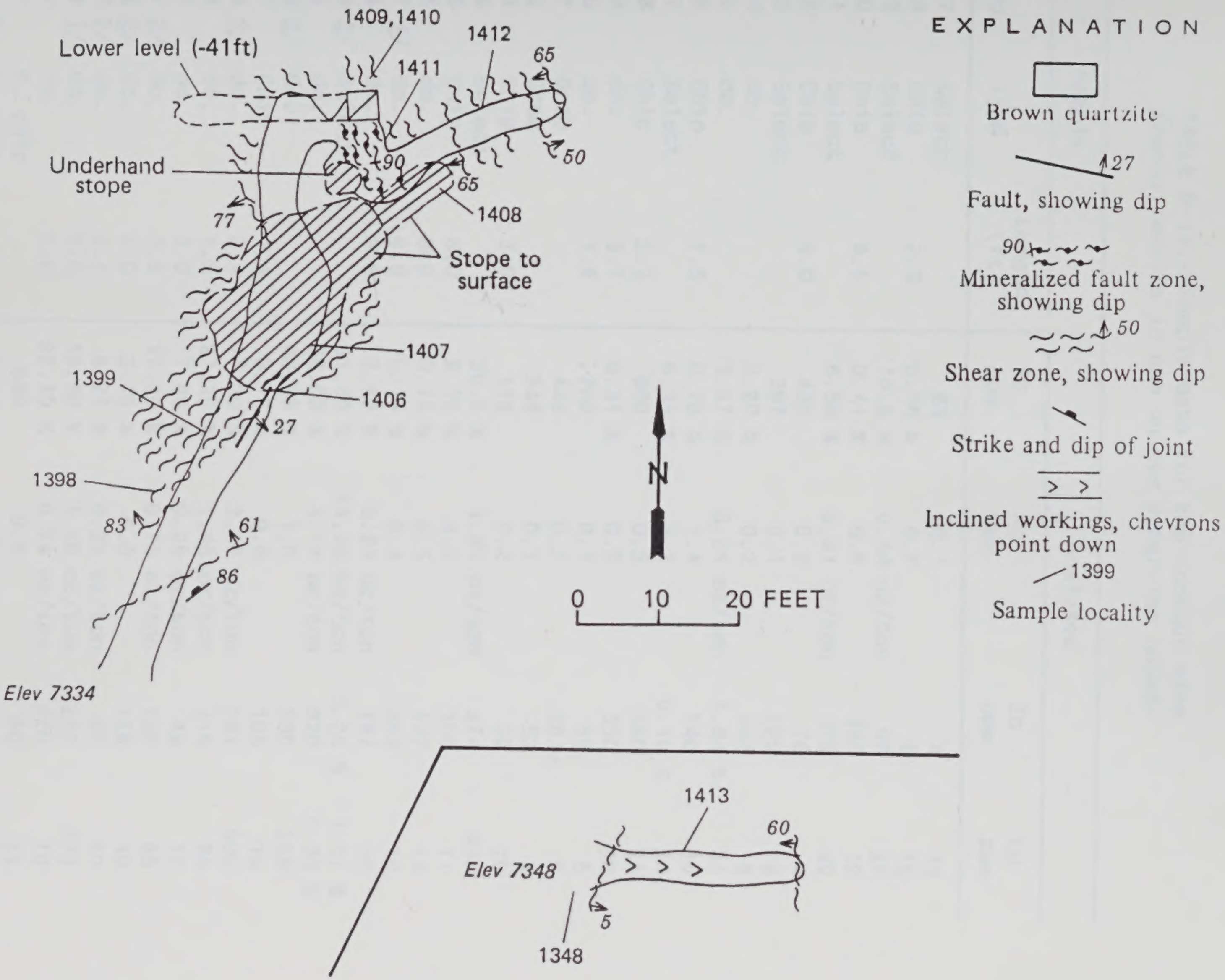

Lower level (-41ft)
1409,1410
1412
1411
65
50
Underhand stope
90
65
1408
77
Stope to surface
1407
1399
1406
27
1398
83
61
86
Elev 7334
N
0 10 20 FEET
EXPLANATION
Brown quartzite
27
Fault, showing dip
90
Mineralized fault zone, showing dip
50
Shear zone, showing dip
Strike and dip of joint
> >
Inclined workings, chevrons point down
1399
Sample locality
1413
60
Elev 7348
> > >
5
1348

FIGURE D-22.– Underground maps, Lookout mine

TABLE D-13.--Sample data for the Lookout mine
(Assay results in ppm unless otherwise noted)

Sample			Analyses			
No.	Type	Length (ft)	Pb ppm	Ag ppm	Zn ppm	Cu ppm
1327	Select		83	0.1	4	13
1328	Chip	2.2	0.56 %	0.7	6	10
1329	Select		10.5 %	0.44 oz/ton	96	25
1330	Chip	6.5	0.41 %	0.6	335	12
1331	Select		6.58 %	0.31 oz/ton	370	49
1332	Chip	5.0	420	0.2	76	4
1333	Select		297	0.1	225	6
1334	do.		0.20 %	0.2	433	8
1335	do.		2.27 %	0.24 oz/ton	1.84 %	31
1336	Chip	7.5	0.78 %	1.4	540	10
1337	Select		6.33 %	5.3	0.10 %	14
1338	Chip	2.2	880	0.3	460	11
1339	do.	3.7	0.31 %	0.5	350	10
1340	do.	1.6	260	0.1	83	5
1341	Grab		445	0.2	261	9
1342	Grab		349	0.1	53	4
1343	Ship	3.0	112	0.2	99	20
1344	Select		29.5 %	1.81 oz/ton	374	438
1345	Chip	6.0	0.13 %	0.5	106	11
1346	do.	6.0	0.13 %	0.5	137	13
1347 1/	do.	6.0	0.14 %	0.4	282	10
1348	do.	3.2	2.89 %	0.23 oz/ton	187	20
1349 2/	Select		31.40 %	14.96 oz/ton	0.26 %	1.57 %
1395	do.		36.50 %	4.14 oz/ton	620	0.33 %
1396 2/	do.		40.20 %	1.0	630	355
1397	Chip	1.4	0.16 %	0.6	108	16
1398 2/	do.	3.4	17.20 %	2.37 oz/ton	161	900
1399	do.	1.5	27.30 %	1.46 oz/ton	115	98
1406	do.	3.0	7.48 %	0.25 oz/ton	49	17
1407 2/	do.	3.8	17.60 %	0.73 oz/ton	196	85
1408 2/	do.	3.0	2.10 %	5.0	119	40
1409 2/	do.	2.1	6.27 %	0.22 oz/ton	82	40
1410 1/	do.	2.0	18.50 %	1.40 oz/ton	242	323
1411	do.	2.8	22.30 %	0.76 oz/ton	220	70
1412	R. chip		830	0.8	60	21
1413 2/	R. chip		0.33 %	1.0	670	11

1/ Also contains 10 ppb gold
2/ Also contains 5 ppb gold

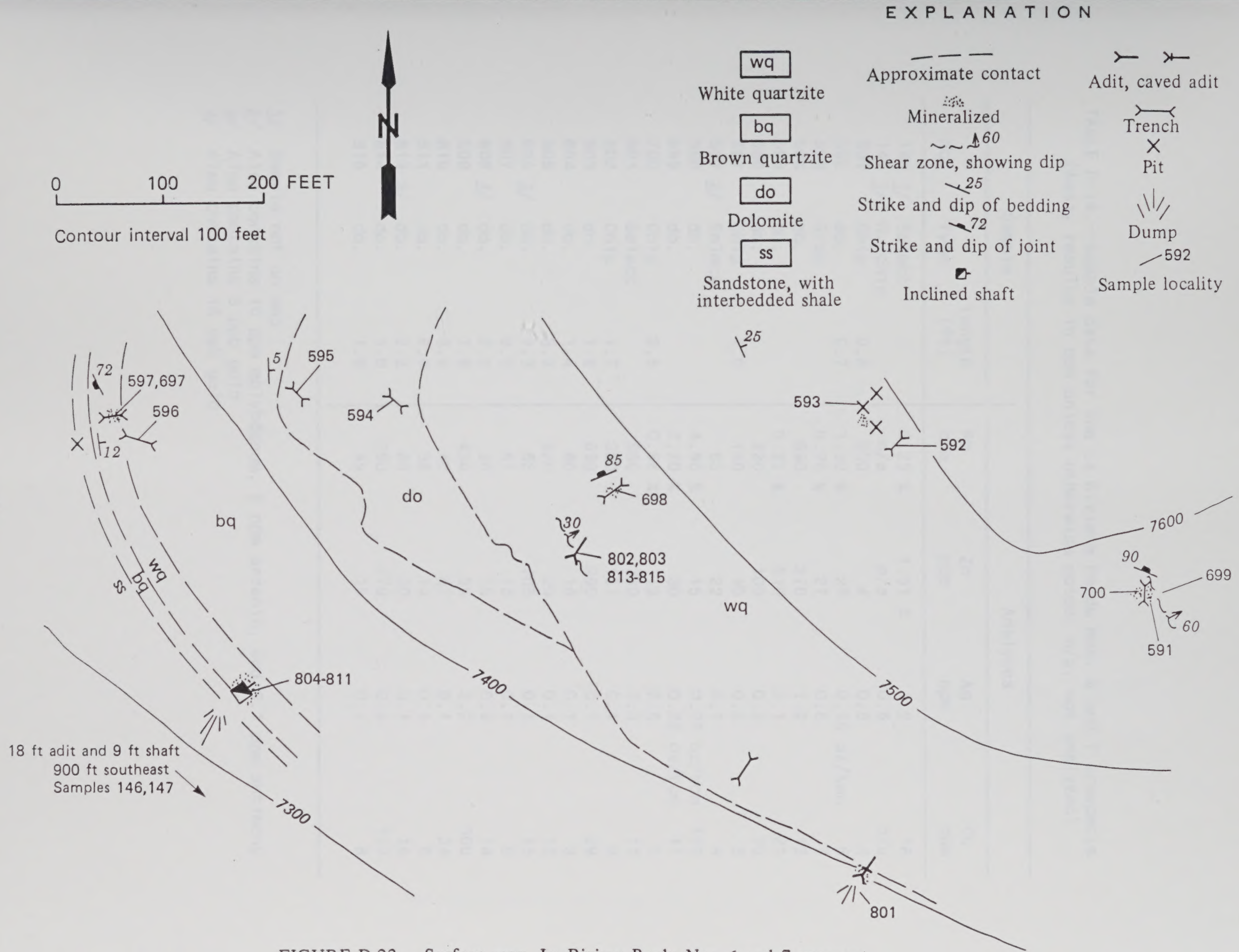

EXPLANATION
wq
White quartzite
bq
Brown quartzite
do
Dolomite
ss
Sandstone, with interbedded shale
Approximate contact
Mineralized
60
Shear zone, showing dip
25
Strike and dip of bedding
72
Strike and dip of joint
Inclined shaft
Adit, caved adit
Trench
Pit
Dump
592
Sample locality
0
100
200 FEET
Contour interval 100 feet
N
72
597,697
596
12
5
595
594
do
bq
wq
bq
ss
804-811
18 ft adit and 9 ft shaft
900 ft southeast
Samples 146,147
7300
7400
85
698
30
802,803
813-815
wq
25
593
592
7500
7600
90
699
700
60
591
801

FIGURE D-23.– Surface map, La Riviere Perdu Nos. 6 and 7 prospect

TABLE D-14.--Sample data for the La Riviere Perdu Nos. 6 and 7 prospects (Assay results in ppm unless otherwise noted; n/a, not analyzed)

Sample			Analyses			
No.	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
146 1/	Select		0.23 %	1.91 %	1.2	16
147 1/	R. chip		n/a	n/a	0.5	n/a
591	Chip	0.8	250	4	0.5	4
592	do.	0.7	1.30 %	26	0.18 oz/ton	8
593	Grab		0.26 %	27	0.8	7
594	do.		690	270	1.2	12
595	do.		0.27 %	610	3.1	21
596	do.		220	100	0.2	10
597	Chip	1.0	150	10	0.5	5
697 2/	Select		83	22	0.1	4
698	do.		4.86 %	15	0.96 oz/ton	172
699	do.		2.20 %	30	0.22 oz/ton	11
700	Chip	2.8	0.54 %	13	2.6	5
801	Select		680	380	2.3	11
802	Chip	1.7	320	151	0.1	8
803	do.	1.6	630	990	0.1	29
804	do.	1.4	80	14	0.1	3
805	do.	3.2	320	29	0.1	12
806 3/	do.	2.3	52	105	0.1	15
807	do.	6.3	67	15	0.1	5
808 4/	do.	2.9	26	18	0.9	14
809	do.	1.9	430	36	2.2	600
810	do.	3.4	42	47	0.1	34
811	do.	6.0	58	14	0.1	5
813 3/	do.	2.2	86	60	0.1	16
814	do.	1.0	250	970	0.4	133
815	do.	1.6	49	18	0.1	6

1/ Sample not on map

2/ Also contains 10 ppm molybdenum, 2 ppm arsenic, and 0.1 ppm antimony

3/ Also contains 5 ppb gold

4/ Also contains 15 ppb gold

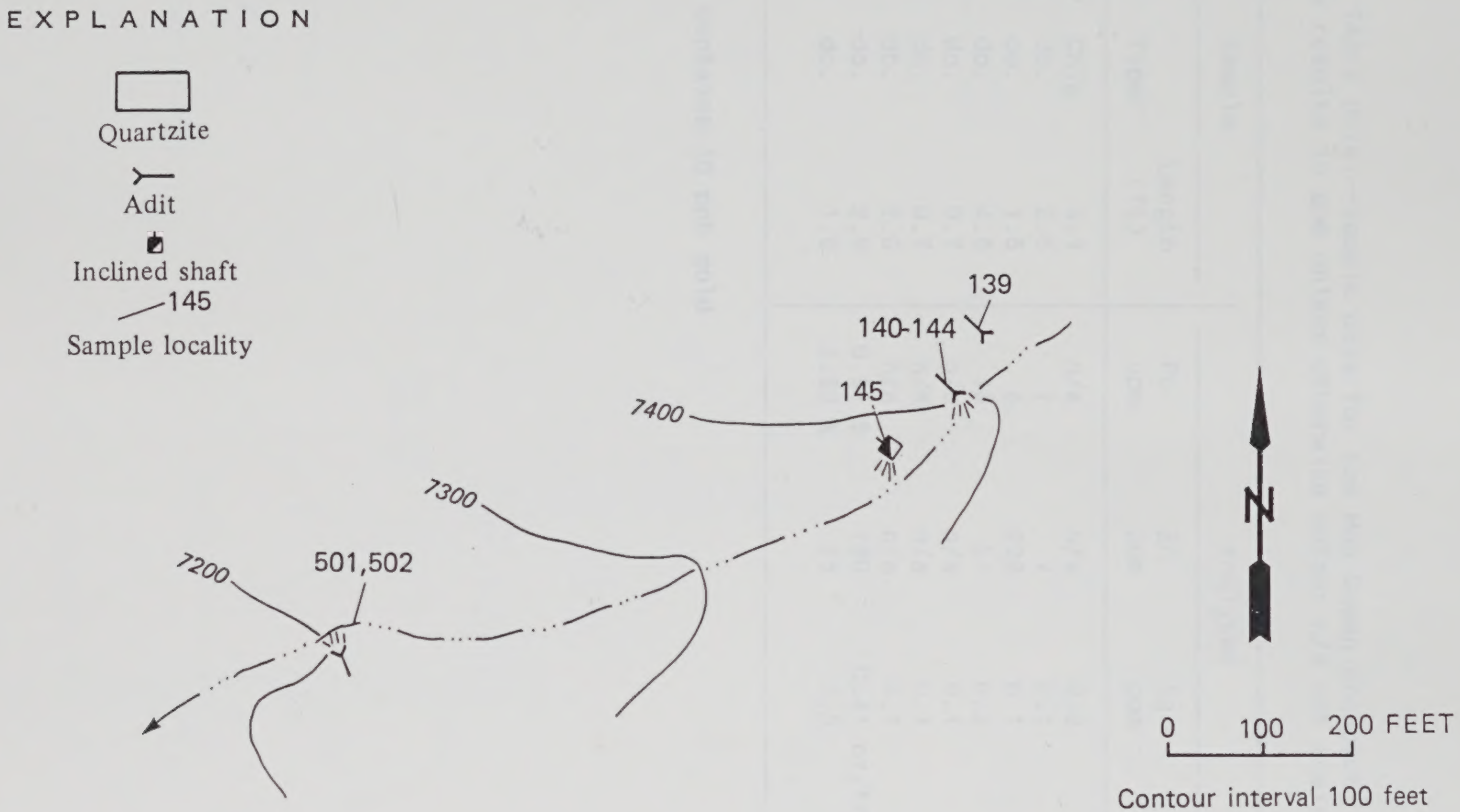

EXPLANATION
Quartzite
Adit
Inclined shaft
145
Sample locality
139
140-144
145
7400
7300
7200
501,502
N
0
100
200 FEET
Contour interval 100 feet

FIGURE D-24.– Surface map, May Queen prospect

TABLE D-15.--Sample data for the May Queen prospect
(Assay results in ppm unless otherwise noted; n/a not analyzed)

Sample			Analyses			
No.	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
139 1/	Chip	4.1	n/a	n/a	0.2	n/a
140	do.	2.5	7	7	0.1	3
141	do.	1.5	6	223	0.1	6
142	do.	4.5	15	51	0.2	3
143	do.	0.7	n/a	n/a	0.1	n/a
144	do.	0.7	n/a	n/a	0.1	n/a
145	do.	2.0	n/a	n/a	0.1	n/a
501	do.	2.9	0.91 %	180	0.41 oz/ton	n/a
502	do.	1.8	2.53 %	25	3.5	7

1/ Also contains 10 ppb gold

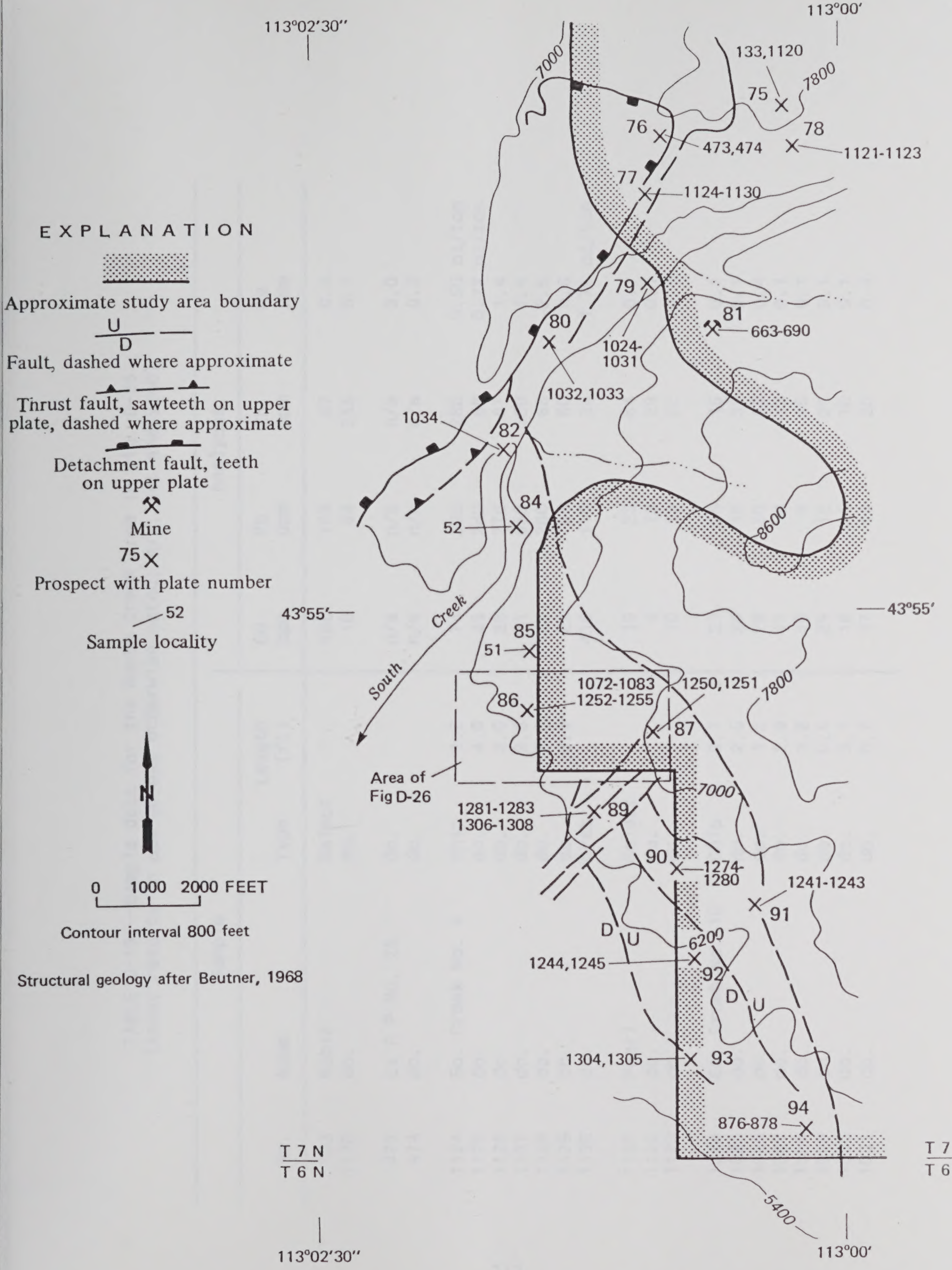

113°02'30"
113°00'
EXPLANATION
Approximate study area boundary
U
D
Fault, dashed where approximate
Thrust fault, sawteeth on upper plate, dashed where approximate
Detachment fault, teeth on upper plate
Mine
75
Prospect with plate number
52
Sample locality
0 1000 2000 FEET
Contour interval 800 feet
Structural geology after Beutner, 1968
7000
133,1120
75
7800
78
76
473,474
1121-1123
77
1124-1130
79
80
81
663-690
1024-1031
1032,1033
1034
82
84
52
8600
43°55'
43°55'
South Creek
85
51
1072-1083
1250,1251
86
1252-1255
87
7800
Area of Fig D-26
7000
1281-1283
1306-1308
89
90
1274-1280
1241-1243
91
D
U
6200
1244,1245
92
D
U
1304,1305
93
94
876-878
T 7 N
T 6 N
T 7 N
T 6 N
5400
113°02'30"
113°00'

FIGURE D-25.– Surface map, South Creek area

TABLE D-16.--Sample data for the South Creek area in fig. D-25
(Assay results in ppm unless otherwise noted; n/a, not analyzed)

Sample				Analyses			
No.	Name	Type	Length (ft)	Cu ppm	Pb ppm	Zn ppm	Ag ppm
133	Rubie	Select		155	120	47	0.4
1120	do.	do.		10	84	255	0.1
473	La R P No. 28	do.		n/a	n/a	n/a	3.0
474	do.	do.		n/a	n/a	n/a	0.3
1124	So. Creek No. 4	Chip	3.5	74	300	280	0.50 oz/ton
1125	do.	do.	4.0	45	280	88	0.22 oz/ton
1126	do.	do.	3.0	28	276	67	1.4
1127	do.	do.	2.5	41	650	100	1.4
1128	do.	do.	3.5	31	200	68	2.5
1129	do.	do.	0.9	23	35	50	0.6
1130	do.	Grab		415	112	38	1.75 oz/ton
1121	Pearl	Select		19	23	84	0.1
1122	do.	do.		4	18	29	0.1
1123	do.	do.		10	12	22	0.1
1024	So. Creek No. 10	Chip	0.7	23	25	16	0.1
1025	do.	do.	2.5	25	18	33	0.1
1026	do.	do.	1.2	28	10	33	0.4
1027	do.	do.	2.9	12	9	13	0.1
1028	do.	do.	3.2	10	6	15	0.1
1029	do.	do.	0.5	29	12	26	0.1
1030	do.	do.	3.1	16	15	10	0.1
1031	do.	do.	0.7	37	10	20	0.4

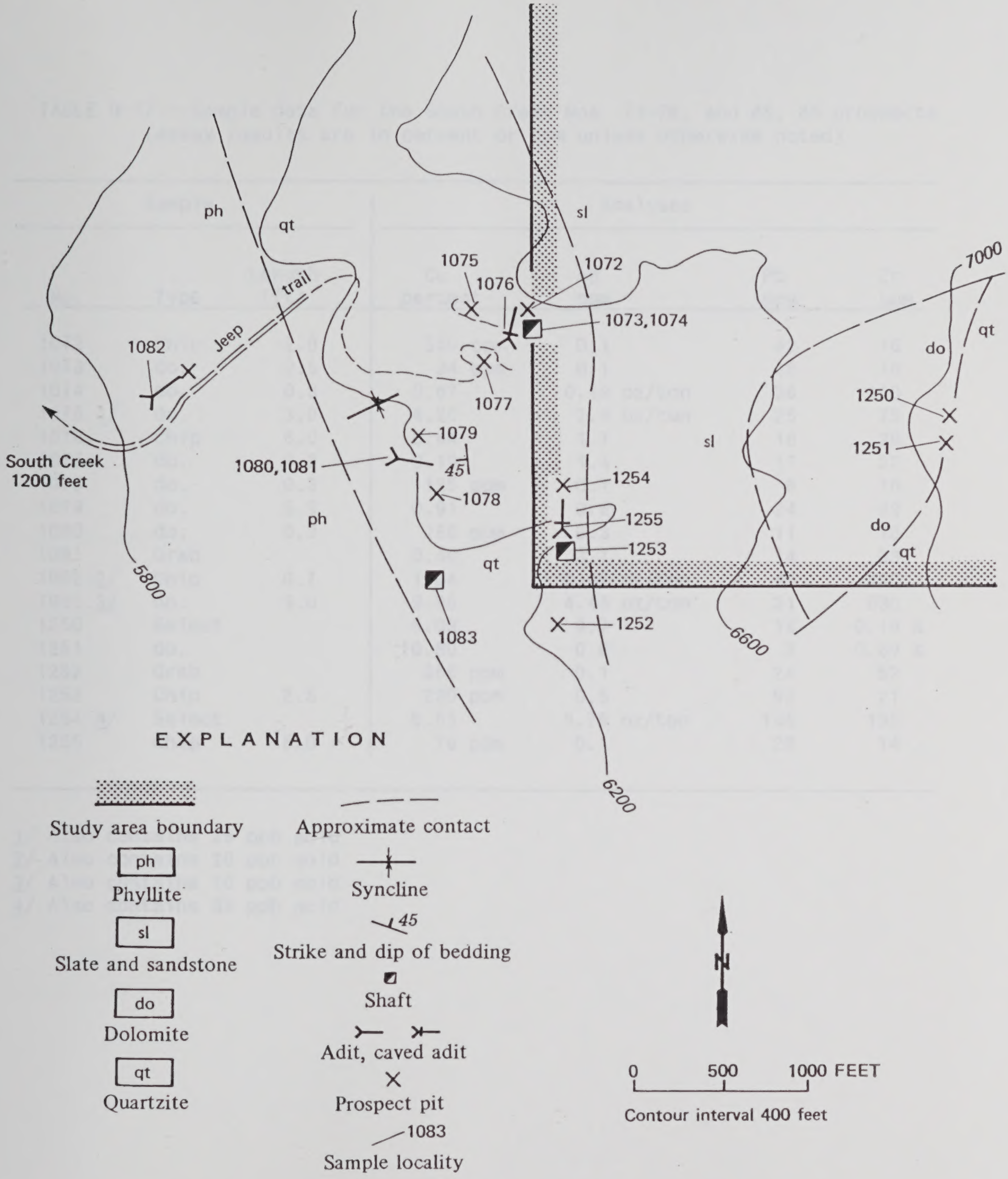
TABLE D-16.--Sample data for the South Creek area in fig. D-25--Continued

Sample				Analyses			
No.	Name	Type	Length (ft)	Cu ppm	Pb ppm	Zn ppm	Ag ppm
1032	So. Creek No. 16	Chip	3.4	338	7	26	0.4
1033	do.	Select		1.71 %	16	90	0.49 oz/ton
1034	So. Creek No. 24	Chip	5.7	39	2	6	0.1
52	So. Creek No. 36	Chip	4.5	n/a	n/a	n/a	0.4
51	So. Creek No. 61	Chip	5.8	16	52	110	0.4
1281	Silver King	Select		0.36 %	2.45 %	840	2.80 oz/ton
1282	do.	do.		500	17.5 %	0.91 %	5.24 oz/ton
1283	do.	do.		6.72 %	370	0.44 %	3.1
1306	do.	Grab		16	5	13	0.2
1307	do.	do.		63	4	1	0.1
1308	do.	Select		33.50 %	6	0.26 %	4.5
1274	North Star	Chip	9.5	7	91	14	0.3
1275	do.	do.	3.2	64	58	4	0.3
1276	do.	Select		2.83 %	64	530	1.0
1277	do.	do.		1.87 %	22	0.34 %	0.4
1278	do.	Chip	3.5	100	37	30	0.4
1279	do.	Select		11.50 %	24	0.20 %	0.6
1280 1/	do.	do.		0.17 %	134	40	1.7

TABLE D-16.--Sample data for the South Creek area in fig. D-25--Continued

Sample				Analyses			
No.	Name	Type	Length (ft)	Cu ppm	Pb ppm	Zn ppm	Ag ppm
1241	So. Creek No. 121	Grab		160	418	61	0.21 oz/ton
1242 2/	do.	Chip	3.0	0.71 %	0.11 %	121	0.21 oz/ton
1243 3/	do.	do.	3.0	350	810	102	0.40 oz/ton
1244 1/	So. Creek No. 119	do.	8.0	82	135	16	0.6
1245 1/	do.	Grab		182	84	13	0.6
1304	So. Creek No. 147	Select		66	46	35	0.1
1305	do.	Chip	0.5	58	30	38	0.1
876	Black Back	do.	2.5	12	1.37 %	80	0.18 oz/ton
877 1/	do.	Select		36	4.39 %	73	1.08 oz/ton
878	do.	do.		7	0.22 %	21	1.2

1/ Also contains 5 ppb gold
2/ Also contains 10 ppb gold
3/ Also contains 15 ppb gold


ph
qt
sl
Jeep trail
1082
South Creek 1200 feet
1075
1076
1072
1073,1074
1077
1079
1080,1081
45
1078
ph
qt
1083
1254
1255
1253
1252
sl
7000
qt
do
1250
1251
do
qt
6600
6200
5800
EXPLANATION
Study area boundary
ph
Phyllite
sl
Slate and sandstone
do
Dolomite
qt
Quartzite
Approximate contact
Syncline
45
Strike and dip of bedding
Shaft
Adit, caved adit
Prospect pit
1083
Sample locality
N
0
500
1000 FEET
Contour interval 400 feet

Geology after Beutner, 1968

FIGURE D-26.-- Surface map, South Creek Nos. 71-78, 88, 89 prospects

TABLE D-17.--Sample data for the South Creek Nos. 71-78, and 88, 89 prospects
(Assay results are in percent or ppm unless otherwise noted)

Sample			Analyses			
No.	Type	Length (ft)	Cu percent	Ag ppm	Pb ppm	Zn ppm
1072	Chip	2.0	530 ppm	0.1	42	16
1073	do.	2.5	34 ppm	0.1	16	16
1074	do.	0.3	0.67	0.19 oz/ton	36	100
1075 1/	do.	3.0	4.20	2.4 oz/ton	25	75
1076	Chip	6.0	0.44	1.7	16	29
1077	do.	0.3	0.19	1.4	17	22
1078	do.	0.3	125 ppm	0.1	8	16
1079	do.	3.9	0.91	0.6	24	49
1080	do.	0.3	156 ppm	0.3	11	10
1081	Grab		0.40	3.7	14	33
1082 2/	Chip	0.7	1.04	0.47 oz/ton	40	490
1083 3/	do.	3.0	9.38	4.43 oz/ton	31	530
1250	Select		5.03	0.7	14	0.19 %
1251	do.		10.80	0.6	3	0.69 %
1252	Grab		365 ppm	0.1	24	52
1253	Chip	2.5	220 ppm	0.5	93	21
1254 4/	Select		6.53	3.79 oz/ton	146	195
1255	Chip	5.0	79 ppm	0.1	28	14

1/ Also contains 25 ppb gold
2/ Also contains 20 ppb gold
3/ Also contains 10 ppb gold
4/ Also contains 35 ppb gold

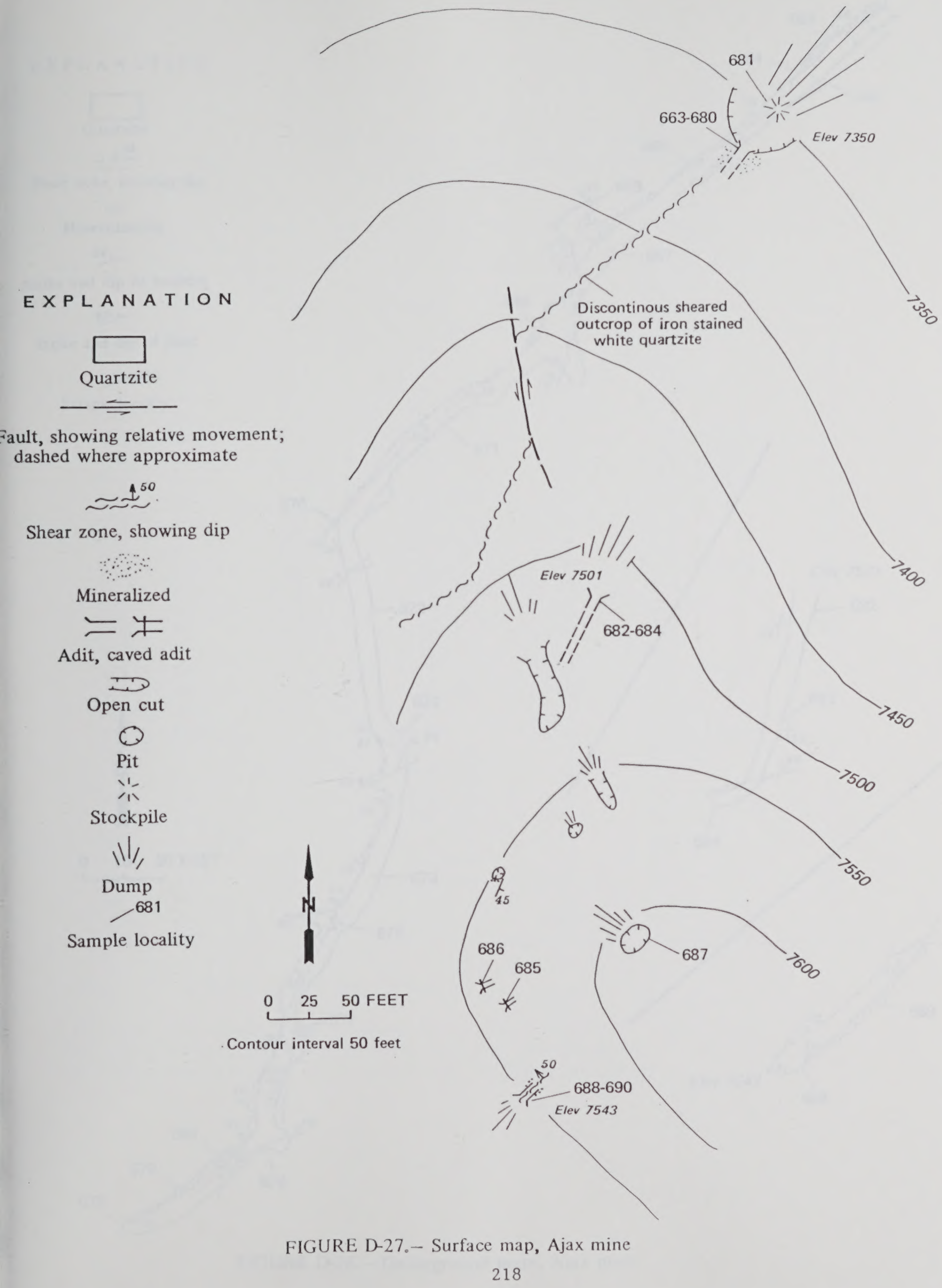

EXPLANATION
Quartzite
Fault, showing relative movement; dashed where approximate
50
Shear zone, showing dip
Mineralized
Adit, caved adit
Open cut
Pit
Stockpile
Dump
681
Sample locality
N
0 25 50 FEET
Contour interval 50 feet
681
663-680
Elev 7350
7350
Discontinous sheared outcrop of iron stained white quartzite
7400
Elev 7501
682-684
7450
7500
7550
45
686
685
687
7600
50
688-690
Elev 7543

FIGURE D-27.– Surface map, Ajax mine

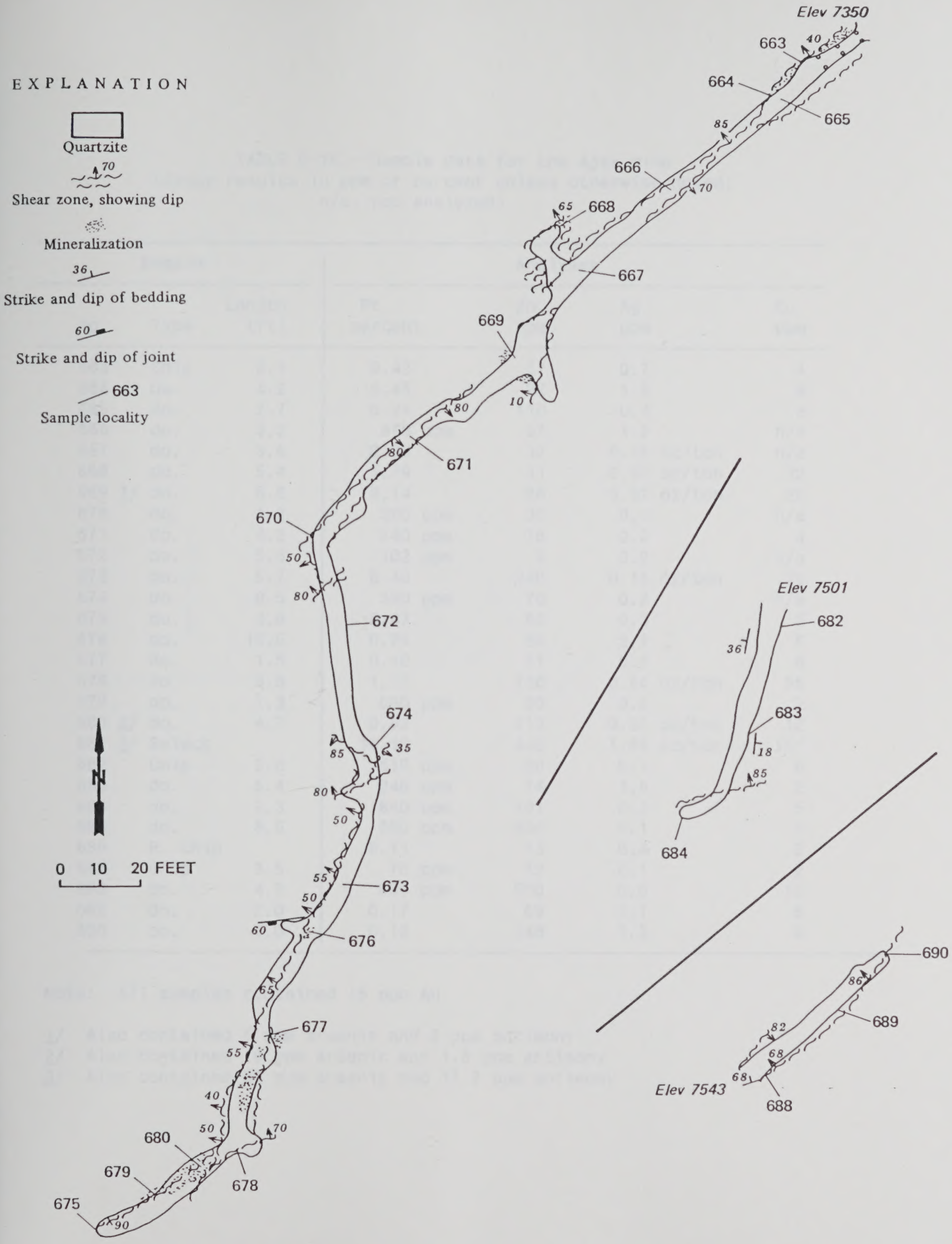

EXPLANATION
Quartzite
70
Shear zone, showing dip
Mineralization
36
Strike and dip of bedding
60
Strike and dip of joint
663
Sample locality
N
0 10 20 FEET
Elev 7350
663
40
664
665
85
666
70
65
668
667
669
10
80
80
671
670
50
80
672
674
85
35
80
50
55
673
50
60
676
65
677
55
40
50
70
680
679
678
675
90
Elev 7501
682
36
683
18
85
684
690
86
689
82
68
68
Elev 7543
688

FIGURE D-28.– Underground maps, Ajax mine

TABLE D-18.--Sample data for the Ajax mine
(Assay results in ppm or percent unless otherwise noted;
n/a, not analyzed)

Sample			Analyses			
No.	Type	Length (ft)	Pb percent	Zn ppm	Ag ppm	Cu ppm
663	Chip	5.1	0.42	17	0.7	4
664	do.	4.2	0.45	22	1.9	6
665	do.	2.7	0.24	110	0.4	5
666	do.	3.2	870 ppm	37	1.2	n/a
667	do.	3.6	0.33	32	0.18 oz/ton	n/a
668	do.	5.4	1.29	41	0.93 oz/ton	32
669 1/	do.	5.6	3.14	86	0.32 oz/ton	20
670	do.	1.2	380 ppm	30	0.2	n/a
671	do.	4.2	240 ppm	18	0.3	4
672	do.	5.5	102 ppm	8	0.2	n/a
673	do.	5.7	0.40	940	0.15 oz/ton	26
674	do.	0.5	390 ppm	70	0.2	n/a
675	do.	3.8	0.47	65	0.3	5
676	do.	10.5	0.25	36	2.2	6
677	do.	1.5	0.10	71	0.9	6
678	do.	3.8	1.72	750	0.54 oz/ton	55
679	do.	1.3	680 ppm	30	0.2	2
680 2/	do.	4.7	0.92	112	0.20 oz/ton	12
681 3/	Select		16.10	440	1.66 oz/ton	151
682	Chip	3.8	510 ppm	60	0.1	6
683	do.	5.4	240 ppm	74	3.5	2
684	do.	2.3	840 ppm	181	0.2	5
685	do.	3.5	580 ppm	860	0.1	4
686	R. chip		0.11	13	0.4	2
687	Chip	3.5	70 ppm	12	0.1	2
688	do.	4.8	990 ppm	500	0.8	12
689	do.	2.0	0.17	69	1.1	5
690	do.	2.0	0.12	148	1.3	5

Note: All samples contained <5 ppb Au

1/ Also contained 5 ppm arsenic and 2 ppm antimony
2/ Also contained 19 ppm arsenic and 1.8 ppm antimony
3/ Also contained 55 ppm arsenic and 17.2 ppm antimony

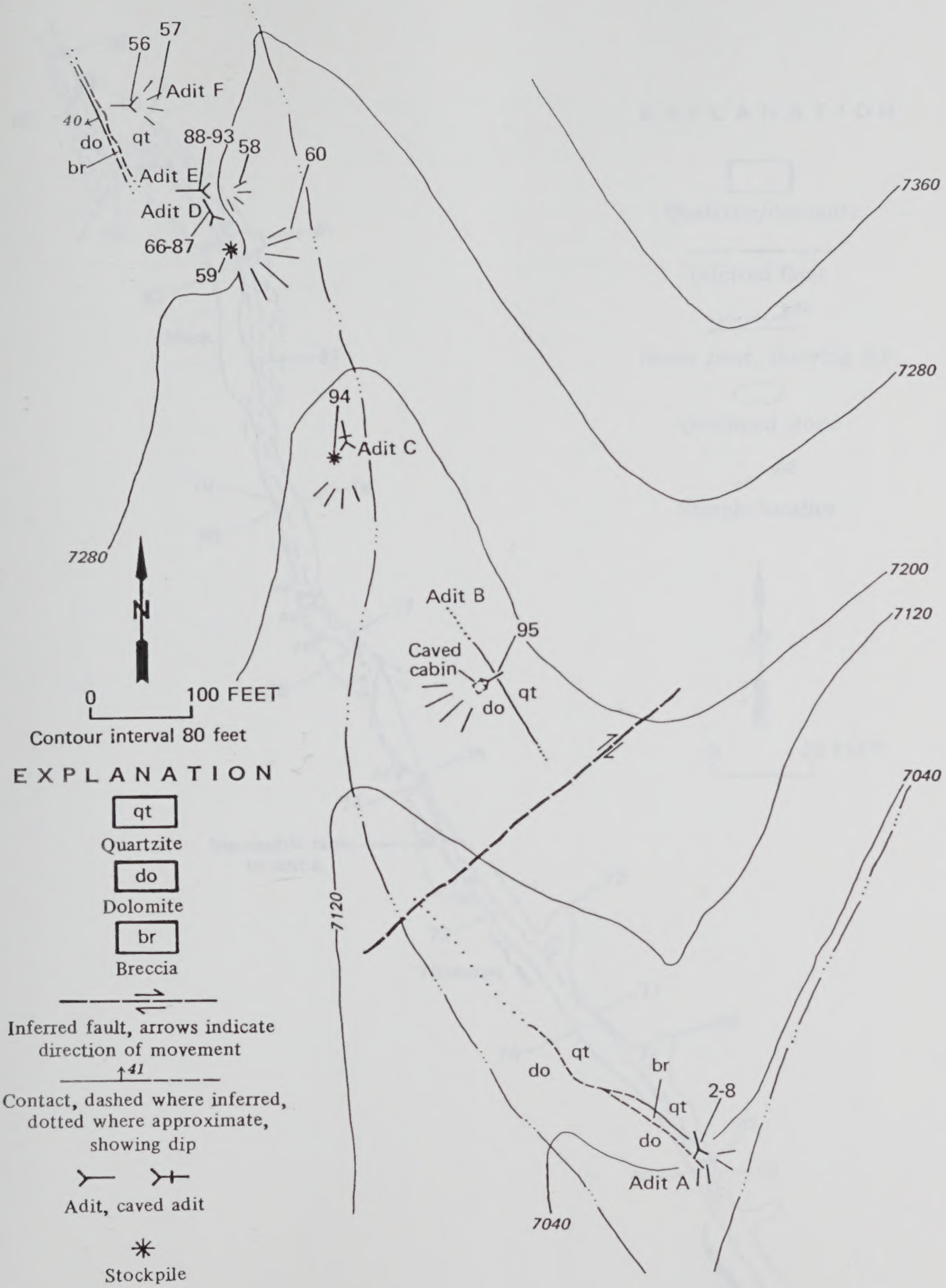

56
57
Adit F
40
do
qt
br
88-93
58
60
Adit E
Adit D
66-87
59
7360
94
Adit C
7280
7280
N
0
100 FEET
Contour interval 80 feet
EXPLANATION
qt
Quartzite
do
Dolomite
br
Breccia
Inferred fault, arrows indicate direction of movement
41
Contact, dashed where inferred, dotted where approximate, showing dip
Adit, caved adit
Stockpile
Dump
59
Sample locality
Adit B
95
Caved cabin
qt
do
7200
7120
7120
7040
qt
do
br
2-8
qt
do
Adit A
7040

FIGURE D-29.– Surface map, Protection prospect

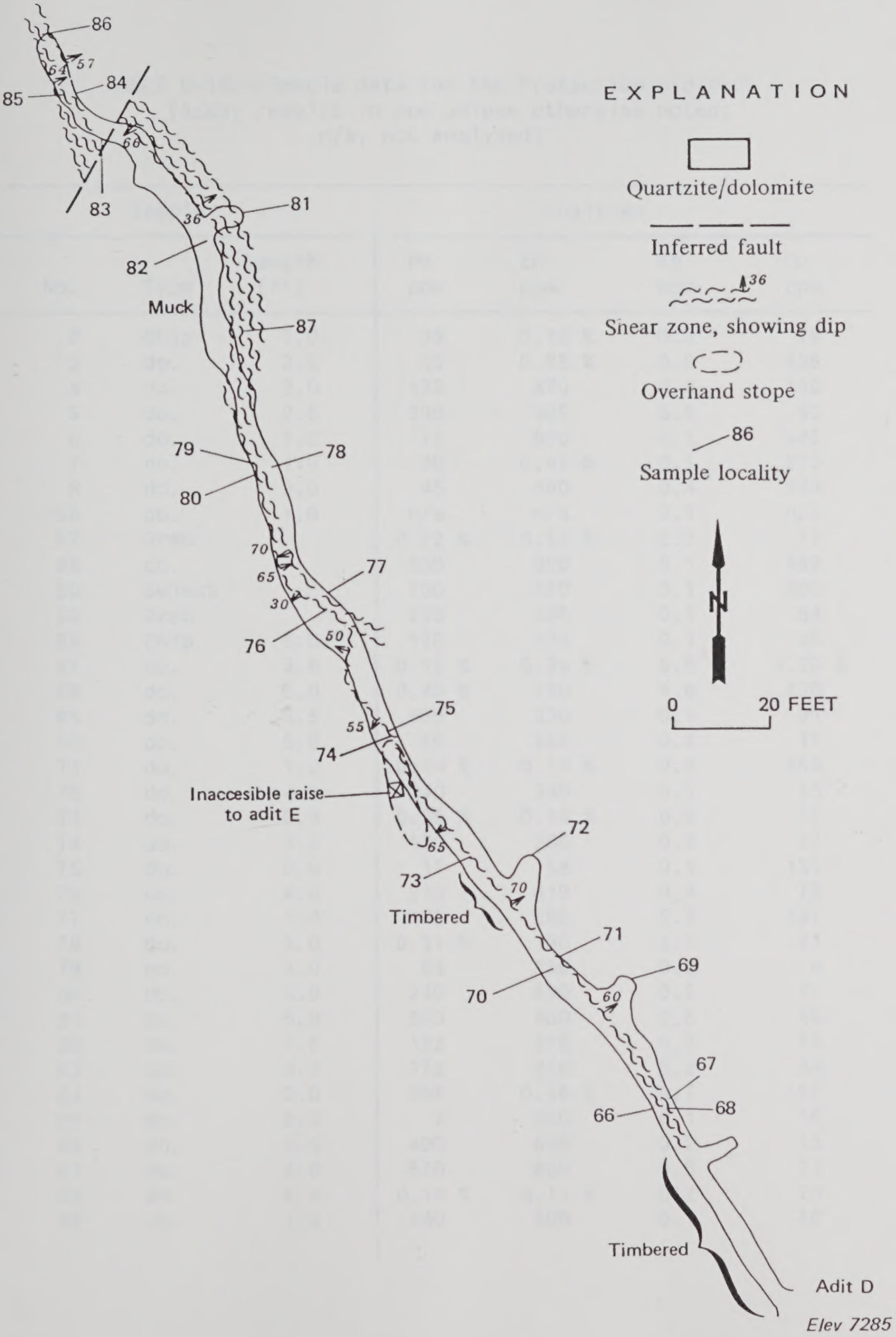

86
57
64
85
84
66
83
36
81
82
Muck
87
79
78
80
70
65
77
30
76
50
75
55
74
Inaccesible raise
to adit E
65
72
73
70
Timbered
71
70
69
60
67
66
68
Timbered
Adit D
Elev 7285
EXPLANATION
Quartzite/dolomite
Inferred fault
36
Shear zone, showing dip
Overhand stope
86
Sample locality
N
0
20 FEET

FIGURE D-30.– Underground map, adit D, Protection prospect

TABLE D-19.--Sample data for the Protection prospect (Assay results in ppm unless otherwise noted; n/a, not analyzed)

Sample			Analyses			
No.	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
2	Chip	1.0	39	0.12 %	0.3	79
3	do.	2.3	45	0.25 %	0.3	435
4	do.	2.0	138	470	0.8	109
5	do.	0.5	200	400	0.6	62
6	do.	1.2	73	880	0.1	345
7	do.	1.0	30	0.42 %	0.1	270
8	do.	2.0	45	880	0.4	343
56	do.	1.0	n/a	n/a	0.1	n/a
57	Grab		0.22 %	0.12 %	2.8	72
58	do.		650	920	0.1	189
59	Select		700	520	0.1	400
60	Grab		283	365	0.1	84
66	Chip	5.0	120	180	0.1	45
67	do.	3.6	0.19 %	0.36 %	5.8	0.30 %
68	do.	5.0	0.40 %	730	4.8	630
69	do.	3.5	600	330	0.1	81
70	do.	5.0	86	258	0.2	11
71	do.	1.2	0.14 %	0.14 %	0.4	363
72	do.	4.0	240	340	0.1	15
73	do.	0.9	0.35 %	0.18 %	0.9	87
74	do.	3.3	120	265	0.5	27
75	do.	0.9	17	58	0.1	131
76	do.	4.0	210	610	0.4	76
77	do.	1.0	170	205	0.6	137
78	do.	3.0	0.51 %	130	2.1	21
79	do.	3.0	84	230	0.2	9
80	do.	3.9	240	690	0.2	37
81	do.	5.0	590	460	0.5	46
82	do.	5.5	122	275	0.3	14
83	do.	3.3	272	310	0.2	49
84	do.	2.0	295	0.16 %	0.7	127
85	do.	2.0	7	650	0.1	16
86	do.	3.5	400	630	0.2	18
87	do.	4.0	570	800	0.5	21
88	do.	6.5	0.16 %	0.11 %	0.2	70
89	do.	1.5	640	900	0.1	18

TABLE D-19.--Sample data for the Protection prospect--Continued

Sample			Analyses			
No.	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
90	Chip	1.5	54	440	0.3	9
91	do.	4.2	0.36 %	0.27 %	1.2	106
92	do.	3.5	680	0.10 %	0.4	34
93 1/	do.	0.5	0.59 %	0.17 %	7.5	220
94	Select		0.11 %	500	3.9	72
95	Chip	2.5	0.16 %	363	0.1	21

1/ Also contains 80 ppm molybdenum and 84 ppm antimony

APPENDIX E.--ADDITIONAL SAMPLE RESULTS FOR MISCELLANEOUS PROPERTIES IN APPENDIX C

Page

Table E-1. Sample data for miscellaneous mines and prospects in Appendix C 226

E-2. Sample data for outcrop samples in the Diamond Peak study area 236

TABLE E-1.--Sample data for miscellaneous mines and prospects in Appendix C
(Assay results in ppm unless otherwise noted; n/a, not analyzed)

Sample					Analyses			
No.	Map no.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
858	1	Hahn prospect	Chip	3.2	0.14 %	540	0.1	4
859		do.	do.	2.9	172	100	0.1	3
860		do.	Grab		78	112	0.1	11
861		do.	do.		34	45	0.1	2
162 1/	2	Hope Nos. 1-3	Grab		600	500	2.4	1.33 %
163 2/		do.	do.		132	530	2.2	1.60 %
164		do.	do.		120	540	0.6	320
863	7	Davis Canyon prospect	Chip	2.3	35	48	0.1	5
864		do.	do.	15.0	32	40	0.1	2
201	8	Warm Creek prospect	do.	1.5	1	14	0.1	20
824		do.	do.	2.6	8	30	0.1	11
825		do.	do.	2.7	3	70	0.1	1
866	9	Lost Cabin	do.	3.0	12	20	0.1	2
842 3/	10	Mammoth Cyn Pros. No. 2	R. chip		1	33	0.1	16
843		do.	Chip	3.0	1	92	0.1	13
844		do.	Select		3	36	0.1	11
845	11	Mammoth Cyn Pros. No. 1	do.		4	150	0.1	12
846		do.	do.		8	430	0.1	16
847		do.	do.		6	142	0.1	11
848		do.	do.		12	185	0.1	12
833		do.	do.		5	18	0.1	9

TABLE E-1.--Sample data for miscellaneous mines and prospects in Appendix C--Continued

Sample					Analyses			
No.	Map no.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
834 4/	12	Mammoth Cyn Pros. No. 3	Grab		0.11 %	600	0.1	10
835 4/		do.	Select		950	350	0.1	8
836 5/		do.	Grab		96	41	0.1	3
869 6/	14	Argalite	do.		27	41	0.1	7
1050	15	Magpie Springs prospect	Chip	3.5	15	32	0.3	0.35 %
1051 6/		do.	do.	1.8	11	35	2.5	0.70 %
267	16	Copper Bell	Grab		18	16	0.1	19
268		do.	R. chip		750	430	0.4	31
269		do.	Grab		34	46	0.1	15
871 7/	17	Silver Bell	Chip	2.0	10	23	0.1	4
872		do.	do.	1.5	13	32	0.1	11
1054		do.	R. chip	40.0	22	26	0.1	51
1055		do.	do.	15.0	19	25	0.1	22
975	18	VJ	Grab		n/a	n/a	0.2	n/a
977		do.	do.		n/a	n/a	0.1	n/a
978		do.	do.		n/a	n/a	0.1	n/a
979		do.	Chip	8.0	n/a	n/a	0.1	n/a

TABLE E-1.--Sample data for miscellaneous mines and prospects in Appendix C--Continued

Sample					Analyses			
No.	Map no.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
207 8/	19	Bell View mine	Chip	3.5	n/a	n/a	0.4	n/a
208 9/		do.	do.	3.5	n/a	n/a	0.3	n/a
209		do.	do.	3.5	n/a	n/a	0.1	n/a
210 10/		do.	do.	4.0	n/a	n/a	0.3	n/a
211		do.	do.	4.0	n/a	n/a	0.1	n/a
212 11/		do.	Grab		n/a	n/a	0.1	n/a
213 12/		do.	Chip	4.0	n/a	n/a	0.1	n/a
214		do.	do.	3.0	n/a	n/a	0.1	n/a
215 13/		do.	do.	3.0	n/a	n/a	0.1	n/a
216		do.	do.	6.0	n/a	n/a	0.3	n/a
217 14/		do.	Select		n/a	n/a	0.1	n/a
218		do.	do.		n/a	n/a	0.1	n/a
271 15/	20	Iron Cap	Chip	3.0	n/a	n/a	0.2	n/a
272		do.	Grab		7	31	0.1	14
273		do.	do.		8	15	0.1	9
1095		do.	do.		0.16 %	35	0.3	4
1096		do.	Chip	4.0	0.20 %	0.78 %	3.7	10
980	21	Bighorn Canyon prospect	do.	3.0	n/a	n/a	0.1	n/a
981		do.	Grab		n/a	n/a	0.1	n/a
361	22	Log Chain	do.		5	52	0.6	6

TABLE E-1.--Sample data for miscellaneous mines and prospects in Appendix C--Continued

Sample					Analyses			
No.	Map no.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
410	23	Williams Creek Prospect	Grab		7	30	0.2	4
411		do.	R. chip		310	30	0.4	7
964	24	Middle Fork Pass Creek	Chip	3.3	21	22	0.1	48
1057	25	Bald Mtn Gulch prospect	Grab		125	21	0.1	12
285	28	Jersey Bell	Select		340	190	0.9	118
1292		do.	Chip	5.5	74	111	0.3	48
1293		do.	do.	6.0	67	164	0.7	92
1294		do.	do.	2.0	378	78	2.6	172
1295		do.	do.	6.6	105	295	0.6	51
1296		do.	do.	5.2	301	142	2.5	0.13 %
1297		do.	do.	4.6	22	29	0.3	19
1298		do.	do.	2.6	64	43	0.3	30
1299		do.	Select		245	61	1.6	116
189	32	Cleopatra	Grab		172	214	0.4	14
337		do.	Select		50	82	0.1	8
1353	33	Triumph	Chip	4.0	860	30	3.9	670
1354		do.	Select		1.23 %	40	1.28 oz/ton	0.25 %
1355		do.	do.		1.95 %	0.13 %	2.63 oz/ton	1.95 %
415	40	Cedar Post	do.		220	78	0.1	16
416		do.	Grab		16	15	0.1	6

TABLE E-1.--Sample data for miscellaneous mines and prospects in Appendix C--Continued

Sample					Analyses			
No.	Map no.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
849	44	Red Bird	Select		215	20	0.7	215
96	47	Uncle Ike Creek prospect	do.		270	0.11 %	0.3	30
54	48	Copper Mtn mine	do.		750	600	2.8	5.18 %
55		do.	do.		90	0.30 %	0.5	12.6 %
64		do.	do.		400	0.26 %	0.1	134
65		do.	do.		0.19 %	0.31 %	0.29 oz/ton	28
61	49	Copper Mtn No. 8	do.		0.27 %	1.0 %	0.18 oz/ton	96
62		do.	Chip	2.5	25	355	0.1	59
63		do.	Select		0.26 %	0.48 %	0.31 oz/ton	50
1309	51	Fallert Springs prospect	Chip	3.0	1	70	0.4	230
451	53	Sagebrush	do.	8.0	20	105	0.1	8
452		do.	do.	5.8	360	300	0.1	8
453		do.	Select		3.5 %	11.1 %	0.73 oz/ton	118
454	16/	do.	do.		4.0 %	12.6 %	1.99 oz/ton	126
983		do.	Chip	8.0	9	145	0.1	20
984	7/	do.	do.	8.0	5	110	0.1	12
985	17/	do.	do.	6.0	8	120	0.1	14
986		do.	do.	5.0	23	86	0.1	8
987	7/	do.	do.	5.0	46	215	0.1	8
988	6/	do.	Grab		49	200	0.1	51
989		do.	do.		73	238	0.1	11
1062		do.	do.		130	50	0.1	15

TABLE E-1.--Sample data for miscellaneous mines and prospects in Appendix C--Continued

Sample					Analyses			
No.	Map no.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
1310	54	Lucky Billy	Chip	0.8	9	293	0.1	240
1311		do.	do.	2.5	10	5	0.1	26
1312		do.	do.	4.0	20	7	0.1	28
1313		do.	do.	4.8	419	467	0.1	14
1314		do.	do.	2.8	33	86	0.1	24
1315		do.	do.	2.7	17	133	0.2	17
1316		do.	do.	1.7	495	279	0.3	20
1317		do.	do.	2.6	63	790	0.2	9
1318		do.	do.	1.9	33	209	0.2	8
1319 18/		do.	do.	3.0	n/a	n/a	n/a	n/a
1320		do.	do.	0.4	51	900	0.3	6
1321		do.	do.	1.0	326	487	0.3	33
1322		do.	do.	3.5	0.11 %	160	0.5	14
1400		do.	Grab		540	44	0.3	20
1401		do.	Chip	0.7	0.26 %	580	0.8	16
1402		do.	do.	1.5	151	349	0.3	17
1403		do.	do.	2.3	0.23 %	69	0.7	3
1404		do.	do.	4.0	489	274	0.3	14
1405		do.	Select		6.27 %	0.20 %	0.47 oz/ton	0.22 %
1089	55	Windfall	Grab		780	500	2.8	190
1090		do.	do.		400	540	1.0	25
1091		do.	do.		78	275	0.1	3
1092		do.	Chip	0.5	65	85	0.1	1
1093		do.	Grab		55	760	0.1	1

TABLE E-1.--Sample data for miscellaneous mines and prospects in Appendix C--Continued

Sample					Analyses			
No.	Map no.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
97	56	UI No. 6 & 7	Chip	0.9	12	16	3.6	0.18 %
98 19/		do.	do.	2.0	37	41	0.41 oz/ton	1.18 %
99 20/		do.	do.	0.8	12	6	0.5	370
100		do.	do.	1.7	6	3	0.2	500
101 21/		do.	Select		13	8	0.5	510
102		do.	Chip	1.0	3	6	0.1	41
1094	57	Sparrow	do.	1.3	276	148	0.6	12
1323	60	Red Ledge No. 8 extension	do.	2.4	21	17	0.2	6
1324		do.	do.	2.0	38	31	0.2	65
1325		do.	Select		7	18	0.3	1.37 %
1235	62	Nellie Boyd	Grab		115	31	0.2	26
1326	64	Red Ledge No. 3	Select		15	17	0.1	110
1392	65	Camp Creek Pros. No. 3	do.		147	81	0.2	80
1393		do.	Chip	5.2	60	37	0.1	16
1394		do.	Select		42	28	0.2	4
1236	66	Waymire	Chip	4.1	55	96	0.1	15
1237		do.	do.	4.8	35	76	0.2	15
1270		do.	do.	0.7	333	200	0.3	11
1271		do.	Grab		309	540	0.2	13
1272		do.	Chip	3.2	347	0.16 %	0.3	16
1273		do.	Grab		148	0.10 %	0.3	9

TABLE E-1--Sample data for miscellaneous mines and prospects in Appendix C--Continued

Sample					Analyses			
No.	Map no.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
1238	67	Camp Creek Pros. No. 4	Chip	4.6	93	161	0.2	12
1239		do.	do.	4.5	58	16	0.1	6
1240		do.	Select		61	510	0.2	31
612	69	Camp Creek Pros. No. 1	Chip	2.3	n/a	n/a	0.1	n/a
613		do.	do.	6.8	n/a	n/a	0.4	n/a
614		do.	do.	0.4	n/a	n/a	0.4	n/a
615		do.	do.	4.1	48	23	0.1	n/a
616 7/		do.	do.	3.5	n/a	n/a	0.1	n/a
651	71	Camp Creek Pros. No. 2	do.	1.1	45	n/a	0.1	n/a
1001	73	Ore House No. 32B	Select		25	0.42 %	0.1	85
1002		do.	Grab		22	0.27 %	0.1	86
13	83	San Francisco	do.		n/a	n/a	0.1	n/a
14		do.	R. chip		n/a	n/a	0.1	n/a
15		do.	Chip	1.6	n/a	n/a	0.7	84
16		do.	do.	3.5	0.28 %	600	0.29 oz/ton	300
17		do.	do.	7.0	900	n/a	0.19 oz/ton	570
18		do.	Select		510	100	2.3	n/a
19		do.	Chip	0.8	250	n/a	3.2	0.61 %
20		do.	Select		0.22 %	n/a	4.6	2.60 %
21	96	BC No. 51	Chip	0.8	n/a	n/a	0.1	n/a
22		do.	do.	0.7	n/a	n/a	0.1	n/a
879	97	BC No. 53 extension	do.	5.0	320	500	0.4	48
880		do.	Grab		50	0.65 %	0.1	6
881		do.	Chip	3.1	44	0.22 %	0.1	12

TABLE E-1.--Sample data for miscellaneous mines and prospects in Appendix C--Continued

Sample					Analyses			
No.	Map no.	Name	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
23	98	BC No. 53	Chip	0.7	n/a	n/a	0.2	n/a
24		do.	do.	4.5	0.28 %	1.37 %	1.5	90
25		do.	Select		n/a	n/a	0.35 oz/ton	n/a
26		do.	do.		n/a	n/a	0.50 oz/ton	n/a
27		do.	do.		n/a	n/a	0.7	n/a
882		do.	Chip	3.0	115	0.23 %	0.1	8
883		do.	Grab		0.14 %	0.80 %	1.4	14
884		do.	Chip	2.0	0.23 %	0.80 %	1.5	9
885		do.	do.	3.0	47	680	0.1	8
886	7/	do.	do.	2.6	125	0.18 %	0.1	4
887	99	BC No. 65	do.	3.2	0.18 %	96	0.1	42
888		do.	do.	2.3	50	0.14 %	0.1	353
889		do.	do.	2.4	20	45	0.1	29
951		do.	Grab		0.25 %	1.53 %	0.5	72
1088	100	Minia	Chip	3.1	6	41	0.1	131

Table E-1. Sample data for miscellaneous mines and prospects in Appendix C.

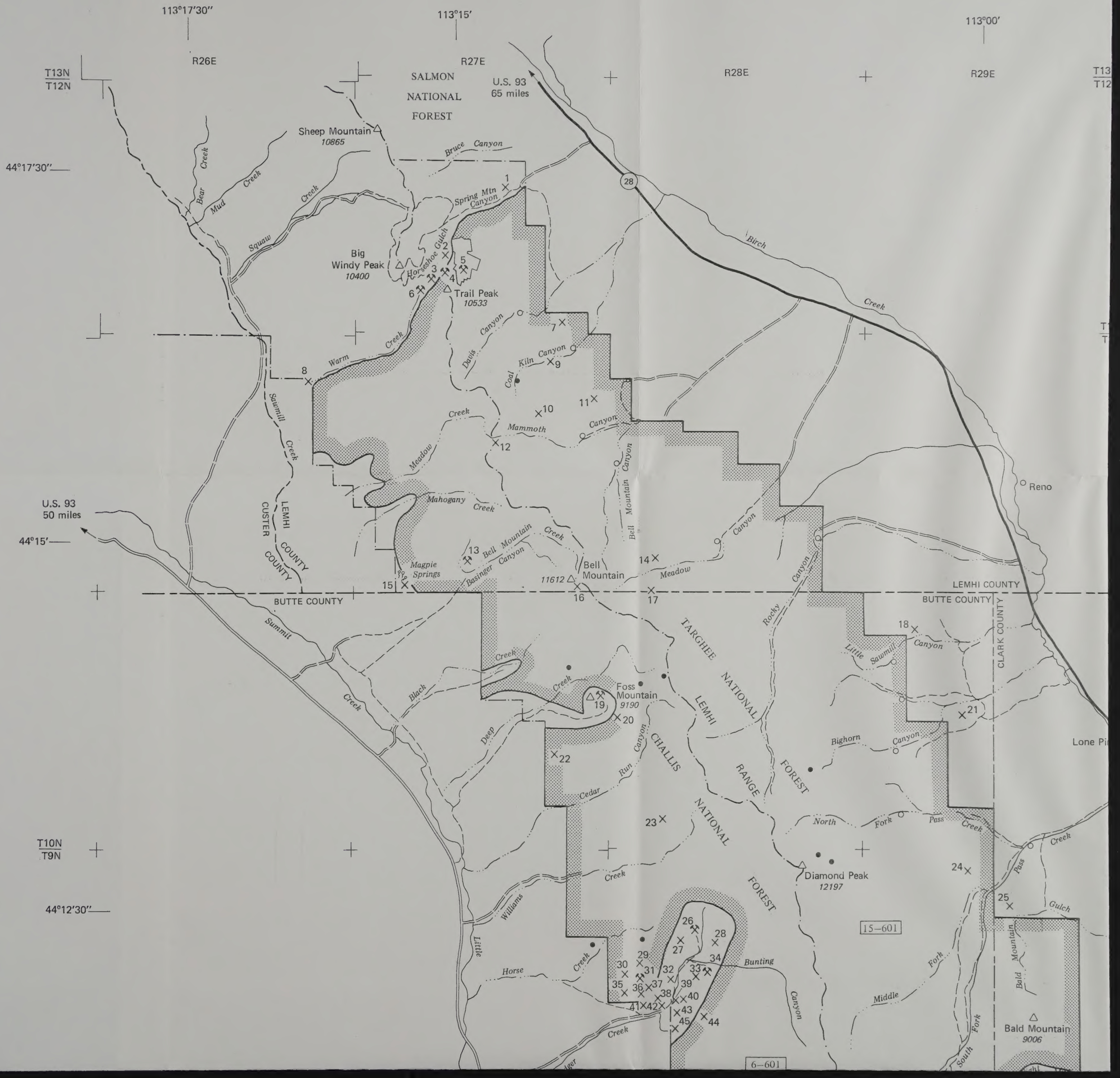
Footnotes

1/ Also contains 25 ppb gold
2/ Also contains 85 ppb gold
3/ Also contains 0.1 ppm iron
4/ Also contains 36 ppm iron
5/ Also contains 1.2 ppm iron and 5 ppb gold
6/ Also contains 10 ppb gold
7/ Also contains 5 ppb gold
8/ Also contains 25 ppm chromium and 40 ppm vanadium
9/ Also contains 20 ppm chromium and 35 ppm vanadium
10/ Also contains 25 ppm chromium and 30 ppm vanadium
11/ Also contains 60 ppm chromium and 160 ppm vanadium
12/ Also contains 120 ppm chromium and 340 ppm vanadium
13/ Also contains 70 ppm chromium and 170 ppm vanadium
14/ Also contains 95 ppm chromium and 150 ppm vanadium
15/ Also contains 60 ppm chromium and 120 ppm vanadium
16/ Also contains 20 ppb gold
17/ Also contains 15 ppb gold
18/ Analyzed only for gold; contains <5 ppb
19/ Also contains 25 ppb gold
20/ Also contains 65 ppb gold
21/ Also contains 0.4 ppm antimony and 105 ppb gold

TABLE E-2.--Sample data for outcrop samples in the Diamond Peak study area
(Assay results in ppm; n/a, not analyzed)

Sample					Analyses			
No.	Map Location	Township, range, section	Type	Length (ft)	Pb ppm	Zn ppm	Ag ppm	Cu ppm
1	South Creek	7N 29E S16	Grab		740	405	0.6	26
270	Bell Mountain	10N 27E S12	R. Chip		70	77	0.2	21
348	Diamond Peak	10N 28E S26	Chip	8.0	5060	110	1.2	6
408	Foss Mountain	10N 28E S18	Grab		18	13	0.2	13
409	do.	10N 28E S17	do.		260	41	0.4	16
413	Diamond Peak	9N 28E S1	R. Chip		26	70	0.2	10
414	do.	9N 28E S1	do.		14	57	0.1	6
832	Saddle Mountain	11N 27E S14	Select		11	70	0.1	15
865	Coal Kiln Canyon	11N 27E S10	R. chip		n/a	n/a	0.1	n/a
1290 1/	Horse Creek	9N 28E S18	Select		9	47	0.4	14
1291	do.	9N 27E S13	do.		1	14	0.2	9

1/ Also contains 5 ppb gold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Sheep Mountain 10865
Bruce Canyon
Bear Creek
Mud Creek
Squaw Creek
Spring Mtn Canyon
Horseshoe Gulch
Big Windy Peak 10400
Trail Peak 10533
Birch Creek
Davis Canyon
Coal Kiln Canyon
Warm Creek
Sawmill Creek
Meadow Creek
Mammoth Canyon
Bell Mountain Canyon
Mahogany Creek
Reno
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44°15'
LEMHI COUNTY
CUSTER COUNTY
Magpie Springs
Bell Mountain Creek
Basinger Canyon
Bell Mountain 11612
Meadow Canyon
Rocky Canyon
LEMHI COUNTY
BUTTE COUNTY
BUTTE COUNTY
CLARK COUNTY
Summit Creek
TARGHEE NATIONAL FOREST
Little Sawmill Canyon
Black Creek
Foss Mountain 9190
Deep Creek
Cedar Run Canyon
CHALLIS NATIONAL FOREST
LEMHI RANGE
Bighorn Canyon
Lone Pi
North Fork Pass Creek
Pass Creek
Diamond Peak 12197
T10N
T9N
44°12'30"
Williams Creek
Little
Horse Creek
Creek
Gulch
Bald Mountain
Bald Mountain 9006
Bunting Canyon
Middle Fork
South Fork
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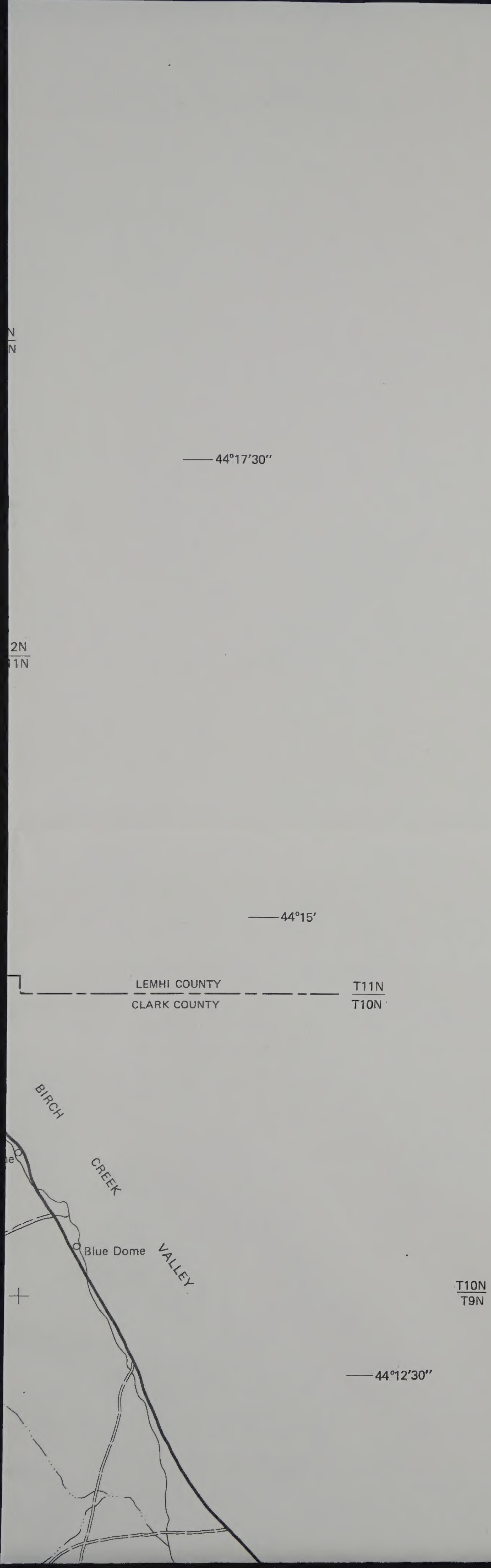
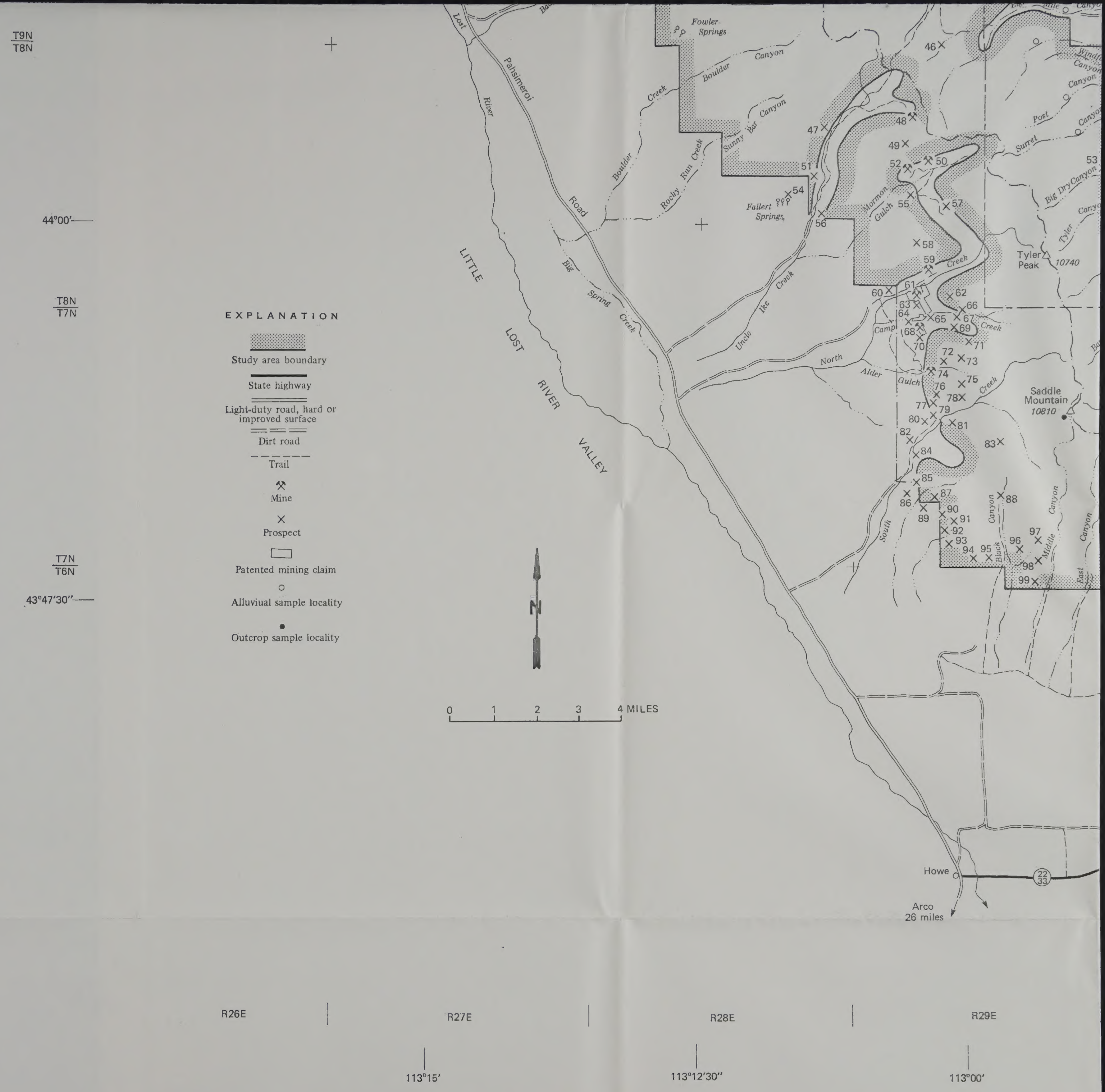


Mines and prospects

1. Hahn prospect
2. Hope Nos. 1-3 prospects
3. Red Warrior mine
4. Iron Mask mine
5. Excelsior mine
6. Dividend mine
7. Davis Canyon prospect
8. Warm Creek prospect
9. Lost Cabin prospect
10. Mammoth Canyon prospect no. 2
11. Mammoth Canyon prospect no. 1
12. Mammoth Canyon prospect no. 3
13. Copper Bluff mine
14. Argalite prospect
15. Magpie Springs prospect
16. Copper Bell prospect
17. Silver Bell prospect
18. VJ prospect
19. Bell View mine
20. Iron Cap prospect
21. Bighorn Canyon prospect
22. Log Chain prospect
23. Williams Creek prospect
24. Middle Fork of Pass Creek prospect
25. Bald Mountain Gulch prospect
26. Automatic mine
27. Lucky Strike prospect
28. Jersey Bell prospect
29. Hope prospect
30. Westside prospect
31. Badger King mine
32. Cleopatra prospect
33. Triumph prospect
34. Badger mine
35. Rainbow prospect
36. Bar No. 2 prospect
37. Nipper prospect
38. Bar No. 7 prospect
39. Badger Creek borrow pit
40. Cedar Post prospect
41. Badger Creek prospect
42. Little Pittsburgh mine
43. Last Chance prospect
44. Red Bird prospect
45. Valley View mine
46. Eightmile Canyon placer prospect
47. Uncle Ike Creek prospect
48. Copper Mountain mine
49. Copper Mountain No. 8 prospect
50. Whitebird mine
51. Fallert Springs prospect
52. Big Horn mine
53. Sagebrush prospect
54. Lucky Billy prospect
55. Windfall prospect
56. UI Nos. 6 and 7 prospect
57. Sparrow prospect
58. Johnson prospect
59. Sentinel mine
60. Red Ledge No. 8 extension prospect
61. Wilbert mine
62. Nellie Boyd prospect
63. Ore House Nos. 6 and 7 prospect
64. Red Ledge No. 3 prospect
65. Camp Creek prospect no. 3
66. Waymire prospect
67. Camp Creek prospect no. 4
68. Lookout mine
69. Camp Creek prospect no. 1
70. La Riviere Perdu Nos. 7 and 8 prospect
71. Camp Creek prospect no. 2
72. May Queen prospect
73. Ore House No. 32B prospect
74. Great Western mine
75. Rubie prospect
76. La Riviere Perdu No. 28 prospect
77. South Creek No. 4 prospect
78. Pearl prospect
79. South Creek No. 10 prospect
80. South Creek No. 16 prospect
81. Ajax mine
82. South Creek No. 24 prospect
83. San Francisco prospect
84. South Creek No. 36 prospect
85. South Creek No. 61 prospect
86. South Creek Nos. 71-75, 88, 89 prospect
87. South Creek No. 78 prospect
88. Protection prospect
89. Silver King prospect
90. North Star prospect
91. South Creek No. 121 prospect
92. South Creek No. 119 prospect
93. South Creek No. 147 prospect
94. Black Back prospect
95. White Rock prospect
96. BC No. 51 prospect
97. BC No. 53 extension prospect
98. BC No. 53 prospect
99. BC No. 65 prospect
100. Minia prospect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EXPLANATION
▨ Study area boundary
State highway
Light-duty road, hard or improved surface
Dirt road
Trail
⚒ Mine
× Prospect
Patented mining claim
○ Alluvial sample locality
● Outcrop sample locality
N
0 1 2 3 4 MILES
Lost River
Pahsimeroi Road
LITTLE LOST RIVER VALLEY
Fowler Springs
Boulder Canyon
Boulder Creek
Sunny Bar Canyon
Rocky Run Creek
Fallert Springs
Mormon Gulch
Big Spring Creek
Uncle Ike Creek
North Alder Gulch
Camp Creek
Surret Post Canyon
Big Dry Canyon
Tyler Canyon
Tyler Peak 10740
Saddle Mountain 10810
South Canyon
Black Canyon
Middle Canyon
East Canyon
Windfall Canyon
46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
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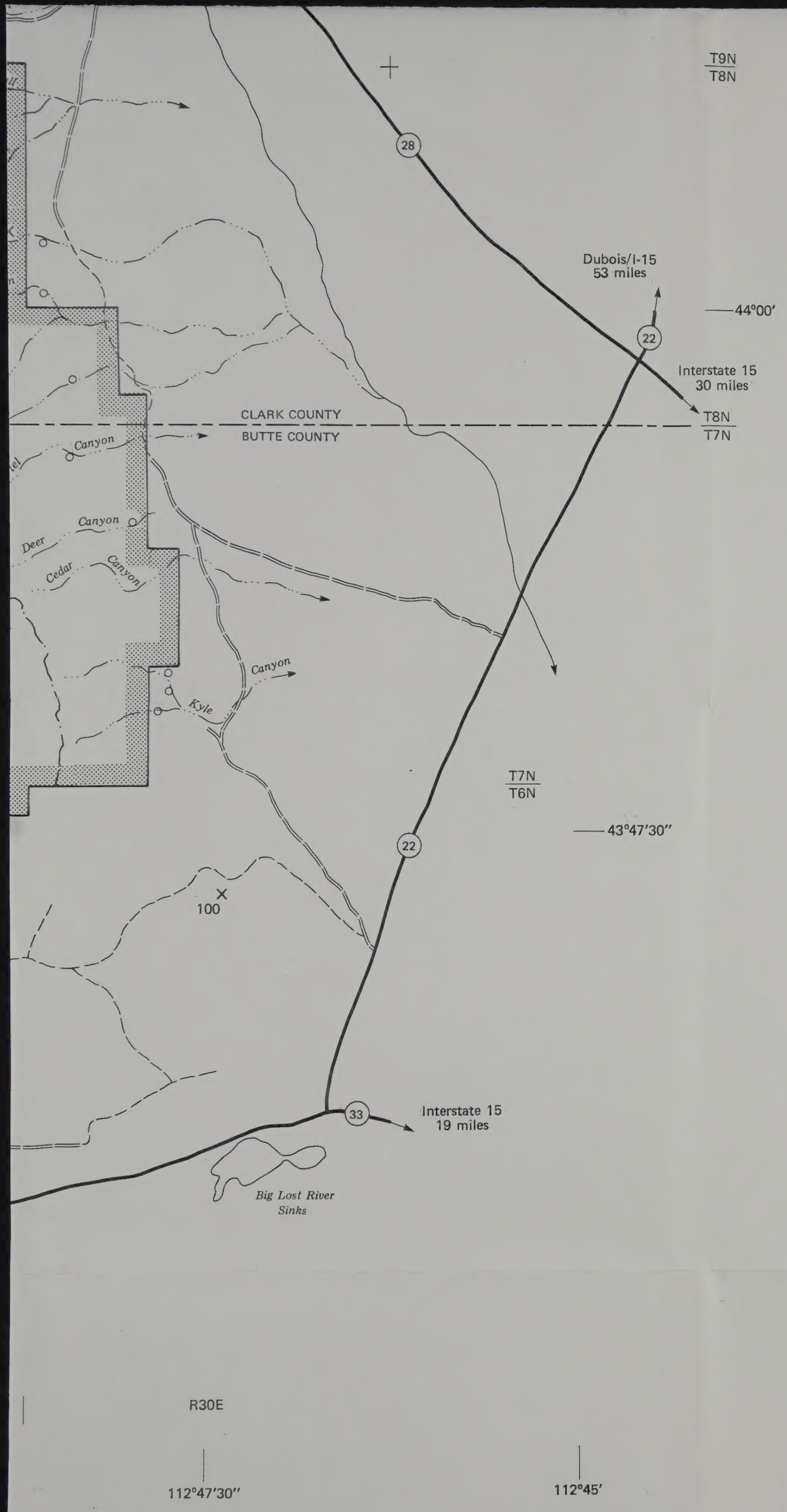
PLATE 1.– Map showing mines and prospects in and adjacent to the Diamond Peak study area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CLARK COUNTY
BUTTE COUNTY
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Canyon
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Canyon
Kyle
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43°47′30″
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Interstate 15
19 miles
Big Lost River
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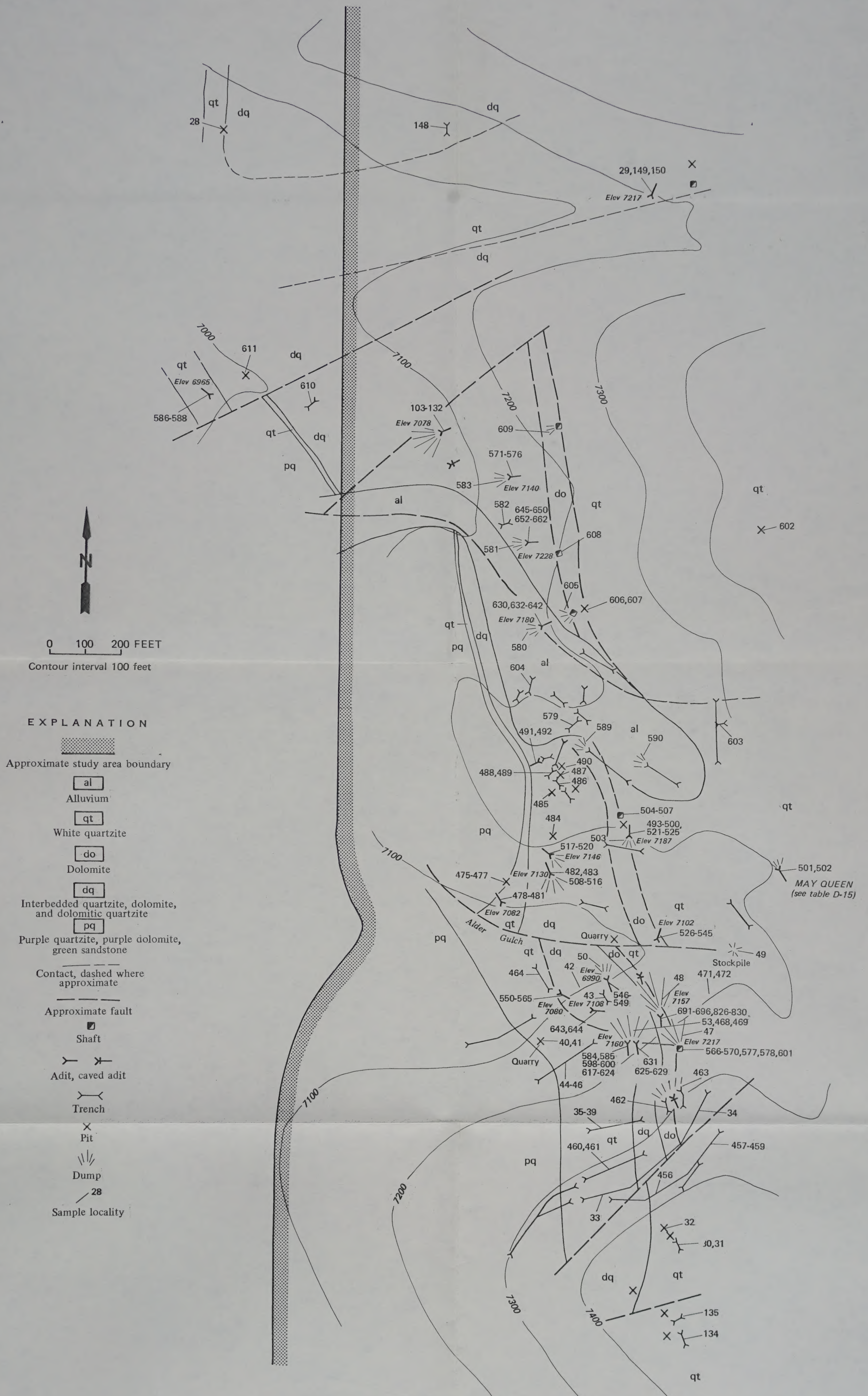
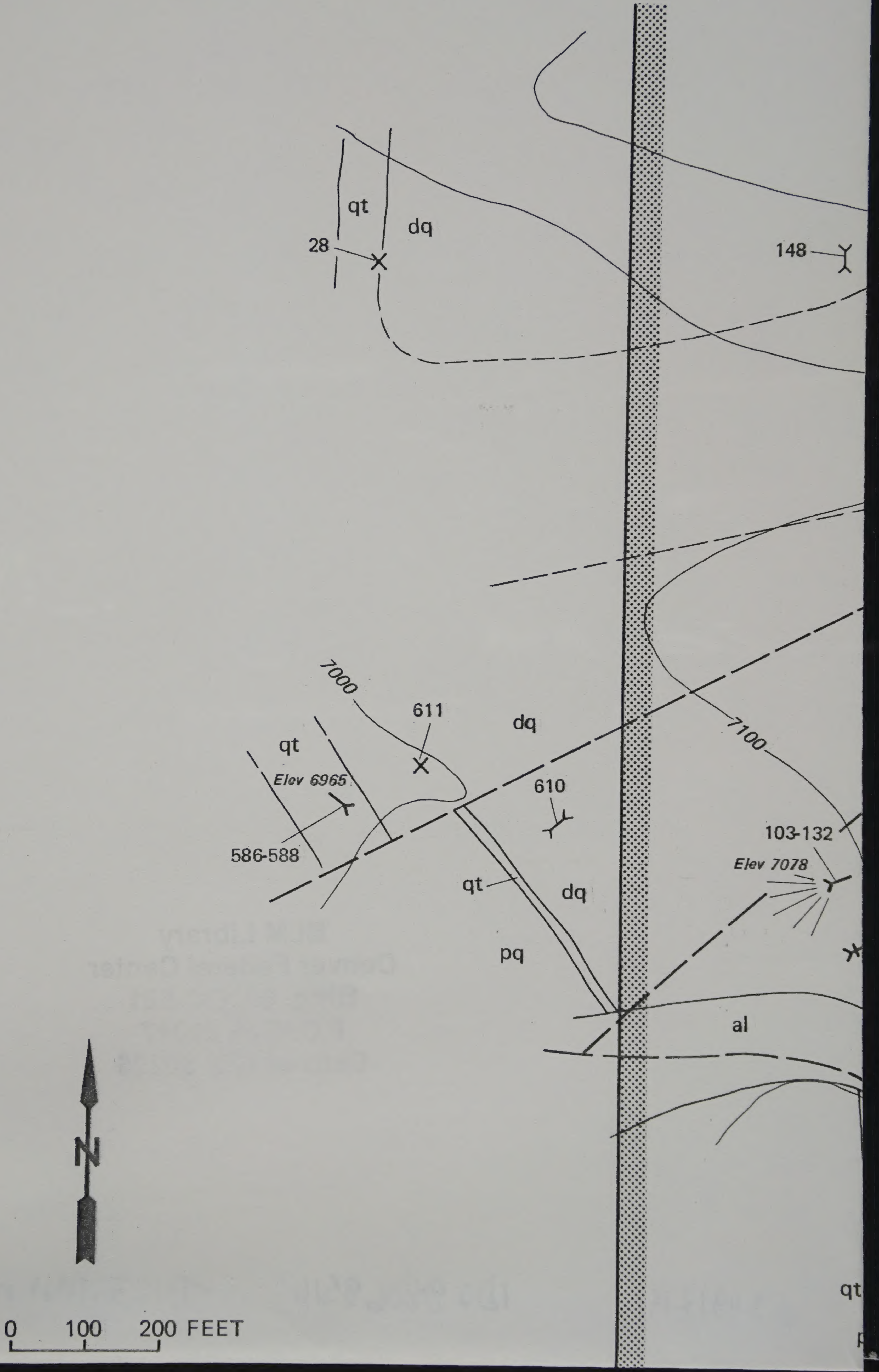
Bldg. 50, OC-521
P.O. Box 25047
Denver, CO 80225

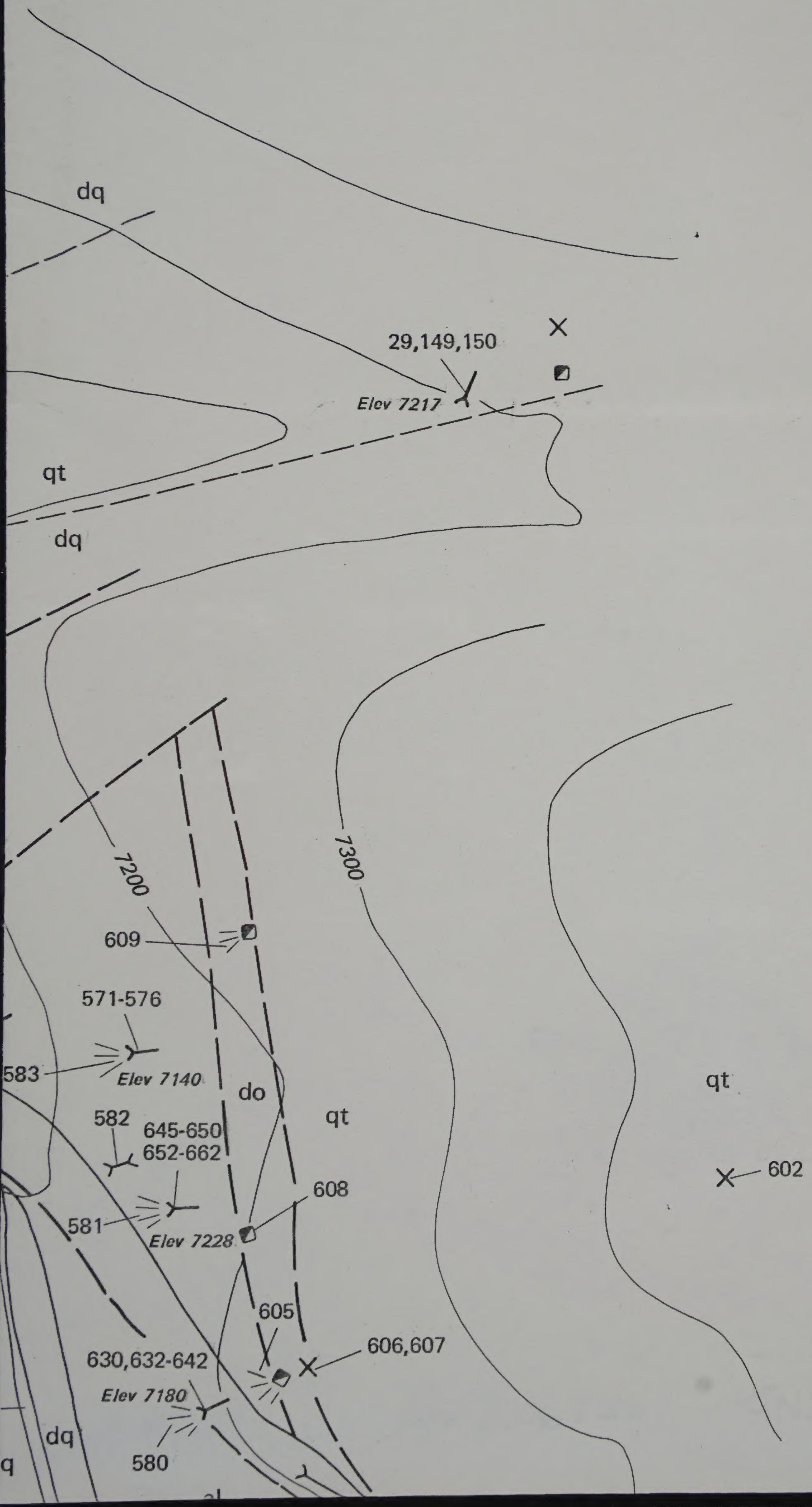
24817191 ID: 88068516 TN23.M11 no.91-11



0 100 200 FEET
Contour interval 100 feet
EXPLANATION
Approximate study area boundary
al
Alluvium
qt
White quartzite
do
Dolomite
dq
Interbedded quartzite, dolomite, and dolomitic quartzite
pq
Purple quartzite, purple dolomite, green sandstone
Contact, dashed where approximate
Approximate fault
Shaft
Adit, caved adit
Trench
Pit
Dump
28
Sample locality
N
28
qt
dq
148
dq
29,149,150
Elev 7217
qt
dq
7000
611
dq
qt
Elev 6965
586-588
610
7100
7200
7300
103-132
Elev 7078
qt
dq
pq
609
571-576
583
Elev 7140
al
582
645-650
652-662
do
qt
qt
602
581
Elev 7228
608
605
630,632-642
606,607
Elev 7180
qt
dq
pq
580
604
al
579
589
al
491,492
590
603
490
488,489
487
486
485
504-507
qt
484
493-500,
521-525
503
Elev 7187
pq
517-520
Elev 7146
501,502
MAY QUEEN
(see table D-15)
7100
475-477
Elev 7130
482,483
508-516
478-481
Elev 7082
qt
Alder Gulch
qt
dq
do
Elev 7102
526-545
pq
Quarry
qt
dq
do
qt
49
Stockpile
50
42
Elev 6990
48
471,472
464
43
546-549
Elev 7157
550-565
Elev 7080
Elev 7108
691-696,826-830
53,468,469
643,644
47
40,41
Elev 7160
Elev 7217
566-570,577,578,601
Quarry
584,585
598-600
617-624
631
625-629
44-46
463
7100
462
34
35-39
qt
dq
do
457-459
460,461
pq
456
7200
33
32
30,31
dq
qt
7300
7400
135
134
qt
136-138

PLATE 2.– Surface map, Great Western mine


qt
dq
28
148
7000
611
dq
qt
Elev 6965
610
586-588
7100
103-132
Elev 7078
qt
dq
pq
al
N
qt
0 100 200 FEET


dq
29,149,150
Elev 7217
qt
dq
7200
7300
609
571-576
583
Elev 7140
do
qt
qt
582
645-650
652-662
608
602
581
Elev 7228
605
606,607
630,632-642
Elev 7180
dq
580

Contour interval 100 feet

EXPLANATION

▨
Approximate study area boundary

al
Alluvium

qt
White quartzite

do
Dolomite

dq
Interbedded quartzite, dolomite, and dolomitic quartzite

pq
Purple quartzite, purple dolomite, green sandstone

——— — —
Contact, dashed where approximate

—— —— ——
Approximate fault

■
Shaft

Adit, caved adit

Trench

×
Pit

Dump

28
Sample locality

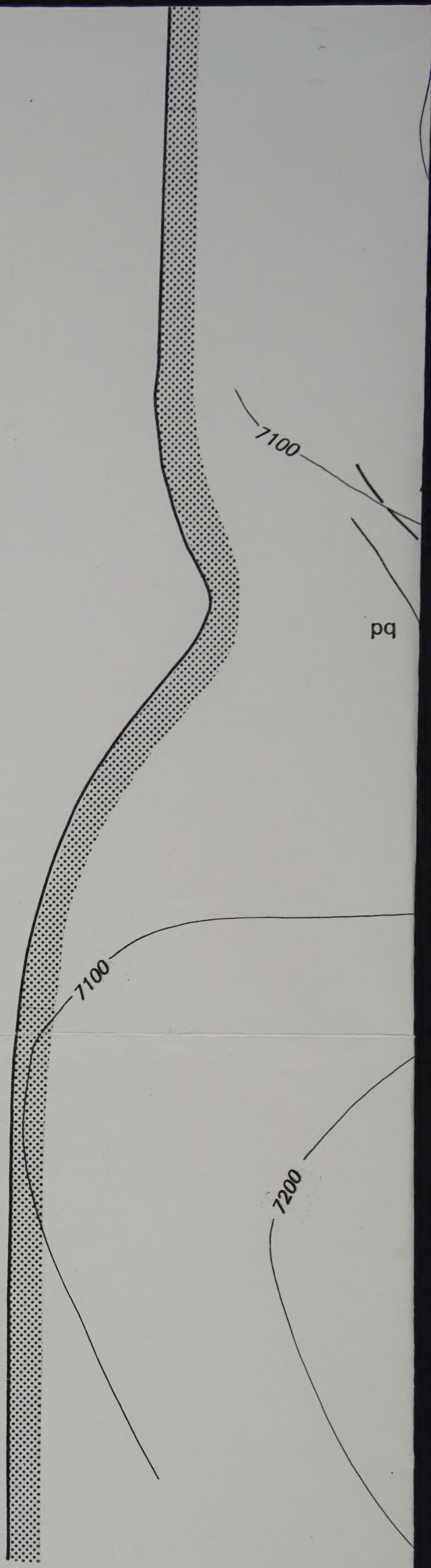
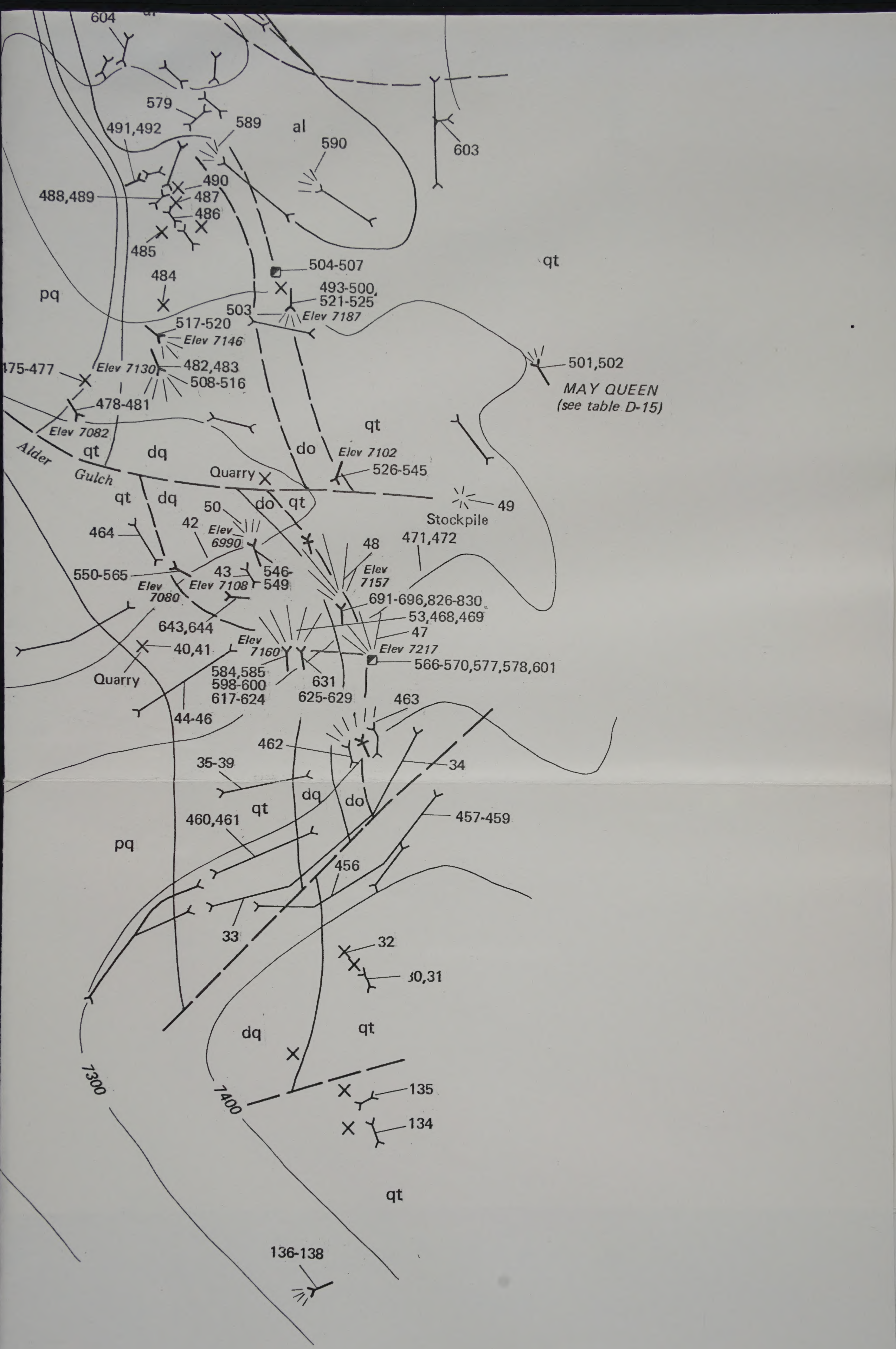


PLATE 2.– Surface r


604
al
579
491,492
589
al
590
603
490
488,489
487
486
485
qt
504-507
484
493-500,
521-525
pq
503
Elev 7187
517-520
Elev 7146
501,502
MAY QUEEN
(see table D-15)
475-477
Elev 7130
482,483
508-516
478-481
Elev 7082
qt
Alder
Gulch
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do
Elev 7102
526-545
Quarry
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49
Stockpile
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Elev
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471,472
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546-
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550-565
Elev
7080
Elev 7108
691-696,826-830
53,468,469
643,644
47
Elev
7160
Elev 7217
40,41
566-570,577,578,601
Quarry
584,585
598-600
617-624
631
625-629
463
44-46
462
34
35-39
dq
do
qt
457-459
460,461
pq
456
33
32
30,31
dq
qt
7300
7400
135
134
qt
136-138

ap, Great Western mine

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